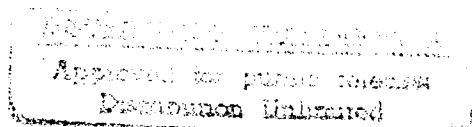


STSC

Requirements Analysis and Design
Technology Report

March 1994



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Preface

This document, Requirements Analysis and Design Technology Report 1994, is a synopsis of the progress of the Software Technology Support Center (STSC) in evaluating requirements analysis and preliminary design computer-aided software engineering products. Throughout this report we will refer to these requirements analysis and preliminary design computer-aided software engineering products as Upper CASE products. The targets of this report are organizations responsible for the development and maintenance of computer software. This report defines the Upper CASE products and identifies their value in improving software quality. It explains how the features of current Upper CASE products can improve software development and maintenance. It includes information about specific products in the marketplace. The information is aimed at those who must make the decisions about acquiring advanced technology and prepare their organizations for its effective use. Finally, this report attempts to identify the future directions of the field to help plan long-range strategies.

The content of this document has changed little from its predecessor, Requirements Analysis and Design Tools Report 1992. The product lists and product information sheets have been completely updated or reverified. Appendix D.1.7: Functional Upper CASE Tools Characteristics was modified to include 1993 standardization issues. There has been some reorganization of the material to reflect growing standardization of STSC technology reports.

Although the material presented in this publication has been reviewed for technical accuracy, no guarantees are made or implied. Product specifications are subject to change by the vendor without notice. Readers should independently verify this information and evaluate it in relationship to their environment.

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1 Requirements Analysis and High Level Design Software Engineering Technology

This report reviews the STSC's recommendations for the selection and usage of software engineering products aimed at the requirements analysis and high-level design portions of the software lifecycle. In the early and mid-1980s, when these products first became available, they were called CASE (Computer-Aided (or Assisted or Automated) Software (or Systems) Engineering) products because they were the first class of products to automate software engineering practices. Later the term Upper CASE was coined to differentiate these products from those that targeted the later phases of the waterfall software lifecycle model. Our use of the term Upper CASE should not be construed as an endorsement of the waterfall lifecycle model. It is used only to represent the aggregation of requirements analysis and high-level design products.

This report focuses on two primary issues. The first, how to select and use Upper CASE products, is intended to provide general guidance to the reader. It describes a process for selecting products and contains anecdotal examples of their use. The examples provide analysis of why Upper CASE product insertions have failed in the past. The second focus of the report is an enumeration and classification of Upper CASE products. The report does not address the very important and often overlooked managerial aspects of methodology selection and training. The report does not justify the use of Upper CASE products either through anecdotal examples or through empirical analysis. Appendix E contains a reading list that does address these issues.

1.1 Upper CASE Product Classification

Upper CASE products can be classified in a number of useful ways. The STSC uses five categories of attributes and features to differentiate and select Upper CASE products. They are:

- Lifecycle Phase
- General Methodology
- Intended Application
- Functional Capabilities
- Product Quality

While these attribute/feature categories are designed to be independent from each other, there are some interrelationships. The first three types – lifecycle phase, general methodology, and intended application – capture information about the basic assumptions of the product developers. These are discussed in detail in Sections 1.1.1, 1.1.2, and 1.1.3. The latter two types, functional capabilities and product quality, in contrast to dealing with the intentions of the product developer, deal with what the product actually does and how well it does it. Functional capabilities and product quality are discussed in Section 1.1.4.

There are many other types of useful product classifications. Examples are types of hardware platforms, types of software platforms, and interoperability with specific other software engineering products or environments. The STSC has not delineated all possible classifications or collected product specific information in any of these "other" classifications. However, we have collected information regarding the hardware and software platforms necessary to support a product.

1.1.1 Lifecycle Phase

Upper CASE products, by our definition, are products that address activities specific to the requirements analysis and high-level design lifecycle phases. The STSC considers identifying the lifecycle phase that a product supports and classifying products by the supported lifecycle phase as a useful aid in making a product selection. While the requirements analysis and high-level design lifecycle phases are generally associated with the waterfall software lifecycle model, we define them here in a nonspecific lifecycle model fashion. All lifecycle models generally have four active steps: (1) determining what will be built, (2) determining how to build it, (3) building it, and (4) maintaining it. These steps are generally called analysis, design, implementation, and maintenance. Maintenance involves repeating the analysis, design, and implementation steps, but the issues of supporting an existing product necessitate it being identified as a separate step. Testing is identified as an additional step in some lifecycle models. In our lifecycle model, testing is the exit activity for each lifecycle step.

Requirements analysis is the lifecycle step in which a determination is made of what will be built. Issues of software functional capability, as well as compatibility, with other parts of the system are addressed. The testing subactivity determines that a software system can be built that meets the requirements, i.e., that the requirements are complete and consistent, and that the requirements are testable in later lifecycle phases. Design is the portion of the lifecycle in which a specification of how the system will be built is created. The design phase is usually

broken into two steps: high-level (also sometimes called preliminary or architecture design) and low-level design (also sometimes called detail design). In high-level design, general algorithms (algorithms contain all three major design considerations: control, data, and state) are developed. These algorithms do not contain implementation details. During low-level design, implementation details (such as target machine architecture timing considerations) are added to the design. Each of these design activities concludes with a testing subactivity that ensures that the design meets its requirements.

1.1.2 Methodology

There are three important development views of software systems – object-oriented (data-oriented), process-oriented (functional or structured), and behavior-oriented (temporal, state-oriented, or dynamic). Each of these views takes a different perspective of the system being developed. This supports the notion of appropriately using differing methodology paradigms that support each of the differing views to address a system's development. Development methodologies typically concentrate on one of the paradigms with support for the other two. The selection of a development methodology should be driven by the problem that is being addressed. The selected methodology should be the one that best supports the view for which the problem is most clearly stated. Some products primarily support one methodology viewpoint, while others may support two or all three.

1.1.3 Application Domain

Products are often appropriate to specific application domains. Types of application domains are:

- Embedded
- Communications, Command, Control, and Intelligence (C³I)
- Commercial Embedded
- Scientific/Engineering/Technical
- Parallel or Distributed
- Artificial Intelligence (Expert Systems)
- Commercial (MIS, Transaction Processing)

The Embedded domain is characterized by applications that *require* response to a stimulus within a specified time period. Example applications include avionics control, radar, and military fire control. These applications are typified by requirements that emphasize timing

issues and extreme design and implementation timing concerns. As software timing requirements begin to approach theoretical hardware speeds, the analysis, design, and testing of timing concerns become critical to the successful implementation of these applications. The military has traditionally called these types of applications "Embedded." We use this terminology. Academic and other nonmilitary organizations sometimes use the terminology "Hard Real Time" or "Real Time/Reactive" to refer to this domain.

The C³I applications domain is much like the Embedded domain in that the software is part of a larger system and there may be timing constraints. It differs in that in C³I applications much more of the system functionality is implemented by software. Example applications include air tasking order generation, mission planning, satellite image interpretation, and battlefield communications.

Applications in the Commercial Embedded domain are similar to embedded applications. Both domains share the attribute of software being a part of a larger physical system. They differ in that Commercial Embedded applications do not have the severe timing constraints of Embedded applications. Consumer products such as videocassette recorders, modern washing machines, and microwave ovens are examples of embedded applications. Outside of the military, this domain is sometimes called (just) "Embedded" or "Real Time."

The Scientific/Engineering/Technical domain is characterized by applications that support engineers and scientists in the creation of products or knowledge. Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), and data analysis and plotting packages are examples of technology that support this domain.

The Parallel (or Distributed) application domain is characterized by applications involving multiple processors including client/server applications, an area of rapid growth. The interactions between the processors are often the most important analysis/design/implementation concern.

The Artificial Intelligence (including Expert Systems) domain generally addresses problems where no algorithmic solutions exist. These problems may have very large solution spaces, where the specialized search techniques of artificial intelligence are appropriate.

The Commercial application domain includes all applications that deal with business data. MIS, Decision Support Systems, and Transaction Processing applications are included in

this domain. These applications handle the receipt, extraction, storage and analysis of data, each category having their own focus and approach to data manipulation.

1.1.4 Functional Capabilities and Product Quality

While the above classifications (lifecycle phase, methodology, and application domain) provide a view of a product's intent, it is still necessary to determine exactly what a product does and how well it does it. To support this concept, a detailed functional taxonomy and a general methodology to evaluate the quality of a product are needed. Appendix D, Upper CASE Product Characteristics, contains an Upper CASE product functional taxonomy and a quality evaluation system.

2 Upper CASE Products

2.1 Upper CASE Products – Product List

An important and necessary step in the technology selection process is to identify candidate products. The current list of 144 Upper CASE products is found in Appendix A, Upper CASE Products – Product List. It includes the product name, vendor, vendor phone number, and some general information about the product. The general information identifies the product's intended use, its intended audience, and what type of platforms it runs on. Due to the very dynamic nature of the CASE product business, the list will contain inaccuracies and omissions at its publication. If you are aware of any, please contact the STSC's Upper CASE team. They can also be contacted for up-to-date lists.

The list was developed from three types of sources: personal experiences, product literature, and conferences. The initial sources for the list were the personal notes, experiences, and contacts of the project engineers. Industry surveys in periodicals such as *Digital Review*, *Byte*, and *Software News* yielded Upper CASE products outside the application domain (real-time software) of the project engineers. STSC members attended several conferences to identify the products that are actively being marketed. Many other conference announcements were studied to identify additional product vendors.

The information in the list was distilled from the product's product sheet (PS). The data collection methodologies used in building the PSs are discussed in Section 2.2. The general information included in the list identifies a product's intended use, its intended audience, and what type of platforms it runs on.

2.2 Upper CASE Products – Product Sheets

Appendix B, Upper CASE Product Sheets, contains the PSs for most of the Upper CASE products in the product list. These reports provide more detailed information than the product list. Users of these reports can make preliminary product assessments based on the information provided. Information on pricing, contacts, support, addressed lifecycle phases and activities, intended audiences, methodologies, hardware platforms, and general product capabilities is included. The information in the reports was obtained either directly from the vendor or from the vendor's literature. In some cases, the vendor has authenticated the

information. There are products in the product list for which there is no associated product sheet. This condition occurs because there was no available information to create the product sheet either because the vendor did not supply any or because the product was added to the product list too late for the creation of a product sheet.

The STSC can be contacted for both unpublished and updated reports that may be available.

2.3 Upper CASE Products – Product Critiques

The STSC is soliciting and using product critiques from experienced product users. These critiques highlight the experiences (both good and bad) of actual product users. If you are a user of a product that is or should be in the product list and would like to write a critique, please contact the STSC. An example product critique is found in Appendix C, Upper CASE Product Critique Format. The Upper CASE team has collected 12 Upper CASE technology critiques. The tools that have been critiqued are listed in Appendix C. The Upper CASE team should be contacted for these and additional critiques.

3 Selection and Use of Upper CASE Products

3.1 When to Use Upper CASE Products

Upper CASE products are an appropriate technology when three conditions have been satisfied. These conditions are (1) a need for the software requirements analysis and design processes to be performed, (2) an ability to automate these processes, and (3) a need to automate these processes. It should be emphasized that having a well-defined software development process will greatly increase the probability of successful technology use. Having no process will almost guarantee failure.

Software requirements analysis and design are necessary (required for military software) for all nontrivial long-lived software systems. Requirements analysis produces a documented description of *what* the software system is supposed to do. It occurs before design and implementation activities. It acts as a contract between the software's consumer and producer. The feasibility of building the software is determined during this process. The outputs of requirements analysis are used by the software designers to produce a software design and (theoretically) by the software maintainers to understand the basic requirements of the software system.

Software design produces a documented description of *how* a software system will fulfill its requirements. It occurs after requirements analysis and before implementation in the waterfall model. There are two recognized design abstraction levels: high-level design and low-level design. They differ in that high-level design captures implementation independent decisions and low-level design captures implementation dependent details. The design process maps the *what* of the requirements analysis process to a description of *how* that can be used in the implementation process. The feasibility of the design may also be determined during this process.

Given that software requirements analysis or design is necessary, the next issue in considering the applicability of Upper CASE technology is an ability to automate these analysis and design processes. Upper CASE technology in its simplest form is just a mechanism to automate existing processes. An organization must have an existing requirements analysis or design process before considering Upper CASE technology. This is a very important consideration. Historically, many organizations have failed to transition to Upper CASE

technology because they did not have an existing process. They attempted to use the Upper CASE technology to automate their process and to define their process. There are very few successful examples of this approach and many examples of failure.

Finally, there must be a need for the automation of the software requirements analysis or design processes to justify the use of Upper CASE technology. These technologies have an associated cost, which includes far more than the actual dollar cost of the technology. Training costs must be considered and are also easy to quantify. Costs that are not so easy to quantify include, but are not limited to, the complexity of the technology (the engineer must now, in addition to understanding the application or the implementation domain, learn the complexities of the product), the cost of tailoring the technology to the organizations processes, and the risks associated with the technology. The technologies great promise is that they deliver more benefits than their costs. Benefits include, but are not limited to, higher quality analysis and design and greater efficiency in producing and maintaining analyses and designs. There are also nonquantifiable benefits such as greater organizational morale, which is possible to achieve with a well-planned technology insertion sheets.

3.2 How to Select Upper CASE Technology

The STSC's selection of it's Upper CASE products: Product List, Product Sheet, and Product Critique is not accidental. They dovetail into a conceptually simple technology selection strategy that closely mirrors that which would be used by a consumer in conjunction with "Consumer Reports" magazine. It is called the "Consumer Report" selection paradigm and is based on six steps. They are:

- 1) Identify candidate product list
- 2) Identify product requirements
- 3) Shorten candidate product list
- 4) Interview product users
- 5) In-house product test
- 6) Decision

There is actually a step zero, where a domain is identified. In this case the domain is Upper CASE products. This domain was identified through a survey of STSC customers during the first STSC conference in 1989 as a technology domain where the customers needed guidance. In the first step, candidate products are identified. The product list satisfies this criterion. See Appendix D for detail CASE tool selection criteria.

The second step is critical to proper technology selection. In this step the "consumer" identifies the requirements that the technology must satisfy. In the software engineering domain, there are two types of inputs to this requirements specification step: process (or organizational) specific and application specific. The selected technology must satisfy the two broad goals that these inputs address. The technology must fit within the organization's software engineering process plan, so that it will be viable in the long term. It also must be usable on the organization's current applications. As an example of this breakout, in the Upper CASE product domain, consider an organization that must use a particular type of hardware platform for a specific development project and has identified a particular analysis/design methodology (such as Object-Oriented Design or Information Engineering) as an organizational standard for its application domain. The technology requirements are that it support the analysis/design methodology (a process requirement) on the particular hardware platform (an application requirement).

The STSC supplies data to support steps three and four, Shorten candidate product list and Interview product users, in the form of the product reports and the user critiques. The PSs contain sufficient data that the product list can be shortened to include only a small subset of technologies that may be suitable to an organization. The user critiques can be used to gather the adhoc experiences of actual users of the technologies on the shortened list. All this information does not negate the need for in-house demonstrations and test projects of the technology. After the in-house testing, buy decisions can be made.

For Upper CASE products, two product domain characteristics drive the selection process. One characteristic involves general product capability and project product requirements. Products are very niche oriented, where they support only a small subset of the Upper CASE product functionality. Since a project's product requirements are very specific, only a small subset of Upper CASE product characteristics is needed for any project. For example, a project may require methodology "X" and currently has platform "Y" and only one

product may support methodology "X" on platform "Y". Thus, there is no opportunity for quality or cost comparisons. From the product selector's viewpoint, finding a product with the necessary functionality for a specific project often constitutes the product selection process.

The second domain characteristic driving the evaluation guidance process involves the type of work that is done during requirements analysis and high-level design. The work involves capturing information and performing analysis on that information. The quality characteristics that are emphasized are the usability of the product and the correctness of the information capture and analysis functions. Since these are engineering support products, the performance of the product, i.e., speed of execution and resource (disk, memory) usage is not as critical as if the product was used in a production environment.

The Institute of Electrical and Electronics Engineers (IEEE) is developing a recommended practice for the adoption of CASE technology. Parties interested in developing this standard are referred to the chairman of working group P1348, Tom Vollman (301) 862-0798. The standard is expected to be ratified in 1995.

3.3 How to Use Upper CASE Products

Once the need for Upper CASE technology has been demonstrated and a product selected and purchased, then it is time to use the product. The issues of training and technology transition are of particular concern when Upper CASE products are initially used. Upper CASE products and methodologies are very complex. Management must budget and plan for the necessary training, or the product will fail. The old practice of putting a software product on good engineers' desks and letting them learn to use it does not work with Upper CASE products. Proper transition to the new technology is also important. The initial project on which the technology is used must be selected with care. Because of the risk associated with new technology, it should not be used or used with extreme caution on an application where delivery time is critical to the organization. However, the application should be important, so that management cognizance is ensured.

In 1992, the IEEE ratified STD-1209 "Recommended Practice for the Evaluation and Selection of CASE Tools." It is not limited to Upper CASE tools or DoD business practices. The authors of this report helped develop this standard and it is consistent with this report. These IEEE "practice" standards tend to reflect a consensus of the best practices of the day.

The standards are valid for five years after which they must be reballoted (after possible revision). This standard is recommended to readers interested in a more detailed analysis of CASE tool evaluation selection. However, the standard should be critically examined because it only reflects the best available, least controversial knowledge of the 1989-1992 time frame.

4 Future Directions

The Upper CASE technology domain is far from mature. We believe that the root cause of this is the overall immaturity of the software engineering discipline. There is no established cohesive theoretical understanding of how best to develop software. Simply put, products cannot automate what humans do not yet know how to do! The good news is that software engineering is receiving a significant amount of research interest and that a solution or at least an understanding of its problems will occur. The bad news is that only evolutionary and not revolutionary (orders of magnitude) improvements are expected.

To date, the technology of the domain can best be characterized as point solutions to specific problems. This approach proved to be inadequate. Specifically, Upper CASE technology cannot be seamlessly integrated into an organization's software development-maintenance process. The organization must alter its process to use the product, rather than altering the product to fit its process. There are at least four technical areas that the technology must address before it can be seamlessly integrated into a generic organization's software process. They are software process automation, tailorable product standards, product interoperability, and product/process visibility. All of these issues are being addressed by the next generation of Upper CASE products and by other supporting technologies.

The concept of software process as the central theme to improve the production of software products is a relatively new one. It has come into vogue over the last five years. Before this, the central theme was the heavy reliance on analysis and design before implementation to improve the quality of software. The first products to support this theme, the initial generation of Upper CASE products, appeared in the late 1970s and early 1980s. Not unexpectedly, Upper CASE technology still does not support the notion of software process. There are two primary technical shortcomings: (1) the technologies (called software engineering environments or software engineering frameworks) for automating software process are very immature and (2) Upper CASE products are not tailorable to an organization's process or methodologies. A basic paradigm shift must occur within the Upper CASE product domain to address these shortcomings. Currently, the products provide either a de facto software process or assume and support none at all. Upper CASE products must adopt a philosophy that they are a subprocess of the larger software process as defined by the process services of the environment and adopt the interface standards of the environment. They must also continue a trend already begun, where an ability exists to tailor the product's implied process and methodologies to an organization's requirements.

The remaining technical issues facing the next generation of Upper CASE products, tailorable product standards, product interoperability, and product/process visibility, are restatements of current problem areas that will be addressed by the process support as already discussed. The lack of tailorable product standards is a differing viewpoint of the issue of lack of process tailorability. In the latter, there is a rigid format of the output of the product or the types of analysis that may be performed. In the former, there is a rigid process and methodology for producing output or performing analysis. Product interoperability is currently implemented on an adhoc, product-by-product basis. The existence of an environment or framework will provide an interface standard currently lacking. The issue of product/process visibility refers to the lack of current product capabilities to provide an overall picture of the state of a project. Because of its knowledge of the overall process, this function will be provided by an environment or framework.

5 Conclusions

This report summarizes the STSC's work in the area of Upper CASE technologies. A list of Upper CASE products has been developed. A list of product characteristics has been developed, and a framework for evaluating those characteristics has been built. The vendors of the Upper CASE products have provided self-evaluations of their products, which have been modified to reflect STSC and STSC customer experiences.

The STSC's plans for the Upper CASE technology project are threefold: publication of the Upper CASE technology domain report (this report); education of our sponsoring community, Air Force software development/maintenance organizations, on Upper CASE technology concepts; and assistance to software development and support activities in Upper CASE technology selection and adoption. In the past we developed the Upper CASE product domain report. We are now and will continue to maintain that report. This maintenance will reflect the continued evolution and an increased understanding of the product domain. The STSC will continue to update the Upper CASE product list and the product characteristic list. Additional product reports and user critiques will be solicited and published. Emphasis will be placed on methodologies and technologies that have been successfully used on specific applications. Requirements management is one area specifically identified for future research.

Educationally, we will develop and present briefings on Upper CASE technology concepts to interested organizations. Papers that summarize Upper CASE technology will be solicited and developed for general dissemination or presentation at appropriate conferences. Finally, Software Development and Support Activities (SDSAs) will be supported in their product selection and adoption efforts on request.

This report will be republished next year.

Appendix A: Upper CASE Products – Product List

This appendix contains a list of Upper CASE products. This list is called the product list. The products are listed alphabetically by vendor name. The list contains general information about the product and the product's vendor. The vendor's name and telephone number are included. Additional information can be obtained in the product's product sheet in Appendix B, Upper CASE Product Sheets. There is also some general information about the product in the list, which identifies the intended use of the product, its intended audience, and on what type of platforms it runs.

Most products are targeted at activities within specific phases of the software lifecycle or activities that occur across lifecycle phases. We have identified four generic software lifecycle activities common to all software lifecycles: Analysis, Design, Coding, and Maintenance. They are not intended to imply any specific lifecycle model such as waterfall or spiral. Reengineering and reverse engineering products are considered maintenance products. We have also identified several activities (Testing, Configuration Management (CM), Documentation, and Project Management) that occur across lifecycle phases. This list is not meant to be inclusive. Other activities may be listed as "Other." Finally, we identified one technology area (Environments or Frameworks) that acts to connect products that automate the various lifecycle phases and activities. A list of abbreviations that occur in the "Type" column appears below. Products may be applicable in one or more activities, so a product may have multiple "Types." More detailed information can be found in the product's PS in Appendix B.

- A: Requirements Specification and Analysis
- D: Design
- C: Coding
- M: Maintenance
- T: Testing
- E: Environment (or Framework)
- U: Documentation and Management Utilities such as CM or Project Management

Vendors usually develop, market, and optimize their products to target specific customer profiles. The "Target" column captures this information. We have identified two primary profiles for the readers of this report, MIS and Technical (TECH). There are two identified subprofiles for the technical profile: Real Time (RT) and Hard Real Time (HRT).

There are many more possible target profiles, such as scientific development, transaction processing, embedded system development, etc., which are collectively identified as "Other" in this list. Some vendors specifically target their products to all market segments. The target for these products is identified as "All." More detailed information can be found in the product's product sheet in Appendix B.

The last general product classification found in the list identifies the type of platform on which the product runs. Three classes of platform have been identified: desktops (DT), workstations (WS), and mainframes (MF). This classification scheme captures the environmental style of the product. Mini-computers are considered workstations in this list. The specific brand of platform is not listed.

Vendor	Tool	Phone	Type	Target	Platforms
HAMILTON TECHNOLOGIES INC.	001 Tool Suite	(617) 492-0058	A, D	ALL	WS
ON-LINE SOFTWARE INTERNATIONAL	AD/Vance Datamodeler	(201) 585-6742	A, D, C	MIS	WS
SOFTWARE SYSTEMS DESIGN, INC.	ADADL	(714) 625-6147	D	TECH, RT	DT, WS
ICONIX	AdaFlow	(310) 458-0092	D, C, T, M	ALL	DT
KNOWLEDGEWARE FEDERAL SYSTEMS	ADW/Workstations	(703) 506-0800	A, D, C	ALL	DT, WS
VERILOG, U.S.A.	AGE	(214) 241-6935	A, D, C, T, M	ALL	WS
TRINZIC CORPORATION	Aion Development System	(617) 891-6500	A, D, C, T, M	ALL	DT, WS
ADVANCED LOGICAL SOFTWARE	ANATOOL	(213) 653-5786	A, D	ALL	DT
SYSTEM SOFTWARE ASSOCIATES, INC.	AS/SET	(312) 641-2900	D, C	TECH, RT	DT, WS
RJO Enterprises, Inc.	Auto-G	(301) 731-6875	A, D, C, T, MU	ALL	WS
STG, INC.	Axiom-SE	1-800-959-2451	A, D, C, U	TECH, RT	DT, WS
BACHMAN INFORMATION SYSTEMS	Bachman/Analyst	(617) 273-9003	A	MIS, TECH	DT, WS
ADVANCED LOGICAL SOFTWARE	BLUES	(213) 653-5786	A, D, C	MIS, TECH	DT
INTERACTIVE SOFTWARE ENGINEERING, INC.	BON OOAD Methodology	(805) 685-1006	A, D, E	ALL	DT, WS
COMPUTER ASSOCIATES	CA-DB:Architect	1-800-645-3003	A, D	MIS	DT
CARDTOOLS SYSTEMS CORP.	CARDTools	(408) 559-4240	A, D, M, U	TECH, RT	WS
AD/CONSULTANTS	CASEware Modeller	(813) 265-3708	A, D, U	MIS	DT
CHEN AND ASSOCIATES, INC.	Chen Workbench	(504) 928-5765	D	MIS, TECH	DT
FLEXUS INTERNATIONAL CORPORATION	CICS SPII	(215) 588-9400	D, C	ALL	DT, WS
FLEXUS INTERNATIONAL CORPORATION	COBOL SPII	(215) 588-9400	D, C	ALL	DT, WS
CORTEX CORPORATION	CorVision	(617) 622-1900	A, D, C, T, M, E	MIS	DT, WS
SYSTEMS CONTROL TECHNOLOGY, INC.	Ctrl - C	(415) 494-2233	A, D, C, M, T, U	TECH	WS
CHARLES RIVER DEVELOPMENT	Data-Station	(617) 424-1820	A, D, C, M, U	MIS, TECH	DT, WS
ICONIX	DataModeler	(310) 458-0092	A, D, C	ALL	DT
V.I. CORPORATION	DataViews	(415) 493-9222	A, D	RT	WS
SQL SOLUTIONS INC.	Deft	(617) 270-4150	A, D	MIS	DT
YOURDON/CGI SYSTEMS, INC.	DesignAid II	(919) 847-9508	A, D, M, U	ALL	DT
COMPUTER SCIENCES CORPORATION	Design Generator	(703) 876-1223	A, D	ALL	DT
META SOFTWARE CORPORATON	Design/CPN	(617) 576-6920	A	MIS, TECH	DT, WS
META SOFTWARE CORPORATION	Design/IDEF	(617) 576-6920	A	MIS, TECH	DT, WS
SOFTWARE SYSTEMS DESIGN, INC.	DESIGNGEN	(714) 625-6147	A, D, C	TECH, RT	DT, WS
S-CUBED, INC.	Developer's Assistant (DAISys)	(203) 323-0760	A, D, C, T, M, U	MIS, RT	DT
QUALITY SYSTEMS AND SOFTWARE	DOORS	+44 81 977 8781	A	MIS	WS

Appendix A: Upper CASE Products - Product List

Vendor	Tool	Phone	Type	Target	Platforms
EVERGREEN CASE TOOLS, INC.	EasyCASE Plus	(206) 881-5149	A, D, U	ALL	DT
EVERGREEN CASE TOOLS, INC.	EasyCASE Professional	(206) 881-5149	A, D	ALL	DT
CADRE TECHNOLOGIES, INC.	Ensemble for C	(301) 897-4101	D, C, T, M, U	MIS, TECH	WS
FUTURE TECH SYSTEMS	Envision	(206) 939-7552	A, D	ALL	DT
SPS SOFTWARE PRODUCTS AND SERVICES	EPOS/RE-SPEC	(212) 686-3790	A, D, C, U	ALL	DT, WS, MF
LOGIC WORKS INC.	Erwin/SQL	(609) 683-0054	D, U	MIS	DT
INTERSOLV	Excelerator Series	1-800-547-4000	A, D	ALL	DT
P-CUBE CORPORATION	EXPERT/CIO	(714) 990-3169	A	MIS	DT
JORDAN-WEBB INFO SYSTEMS, LTD.	Exsys	(708) 673-2288	A, D, T, E, U	ALL	DT, WS, MF
SUNRISE SOFTWARE INTERNATIONAL	EzX	(401) 847-7868	A, D, C, M, T	MIS, TECH	DT, WS
ICONIX	FasT Task	(310) 458-0092	A, D, C	ALL	DT
NU THENA SYSTEMS	Foresight	(703) 356-5056	A, D, T	RT	WS
MENLO BUSINESS SYSTEMS	Foundation Vista	(415) 948-7920	A, D, M	MIS, TECH	DT
ICONIX	FreeFlow	(310) 458-0092	A	MIS, RT	DT
SYCO (U.S. DISTRIBUTOR: MLSI)	G++	(617) 862-2709	D, C, E	TECH	WS
COMPUTER SYSTEMS ADVISERS	Goldrun	1-800-537-4262	A, D	ALL	DT, WS
EVb SOFTWARE ENGINEERING COMPANY	Grammi	(301) 695-6960	A, D, C, E	ALL	WS
D. APPLETON COMPANY, INC.	IDEF/Leverage	(310) 374-3939	A, D, U	MIS, TECH	WS
INFORMATION ENGINEERING SYSTEMS CORP.	IE:Advantage	(703) 739-2242	A, D, T, M, U	ALL	
KNOWLEDGEWARE FEDERAL SYSTEMS	IEW/Workstations	(703) 506-0800	A, D, C	ALL	DT
IPSYS SOFTWARE	Information Engineering (IE)	(508) 463-0006	A, D, C, T, M, U	MIS	WS
TEXAS INSTRUMENTS	Information Engineering Facility (IEF)	(214) 575-4553	A, D, C, T, M	MIS	DT, WS
LBMS, INC.	Integrated System Engineering Toolset	1-800-231-7515	A, D	MIS, TECH	DT
INTERACTIVE SOFTWARE ENGINEERING, INC.	ISE Eiffel 3	(805) 685-1006	D, C, T, M, E	ALL	WS
LPS (LANGUAGE AND PROGRAMMING SYSTEMS)	Keyone	(39)11.831830	D, C, U	ALL	DT, WS
LANSA USA INC.	LANSA/AD	(708) 323-7779	D, C, T, M, U	MIS	WS
LANSA USA INC.	LANSA/DESIGNER	(708) 323-7779	A, D	MIS	WS
LANSA USA INC.	LANSA/PC	(708) 323-7779	S, X, R, M, U	MIS	DT
LANSA USA INC.	LANSA/RUOM	(708) 323-7779	D, C, T, U	MIS	DT
LANSA USA INC.	LANSA/X	(708) 323-7779	D, C, T, M, U	MIS	DT
UNISYS CORPORATION	LINC II	(215) 993-6135	A, D	MIS	WS
EXCEL SOFTWARE	MacAnalyst	(515) 752-5359	D, E, U	MIS, TECH	DT
EXCEL SOFTWARE	MacAnalyst/Expert	(515) 752-5359	A, D, E, U	ALL	DT
STARSYS, INC.	MacBubbles	(301) 946-0522	A, D	ALL	DT

Vendor	Tool	Phone	Type	Target	Platforms
EXCEL SOFTWARE	MacDesigner	(515) 752-5359	A, D	ALL	DT
SOFTLAB, INC.	Maestro II	(415) 957-9175	A, D, C, M, T, E, U	MIS	DT, WS
MAGEC SOFTWARE	Magec Rapid Application Development System	1-800-336-2432	A, D, C, T, M, U	ALL	DT, WS
ADVANCED DEVELOPMENT METHODS	MATE	(617) 861-7848	A, D	ALL	DT
INTEGRATED SYSTEMS, INC.	MATRIX X, SystemBuild, & Autocode	(408) 980-1500	A, D, C	RT	WS
VENUE	Medley w/Rooms	(415) 508-9672	D, C, E	TECH	DT, WS
APPLIED AXIOMATICS	Metavision	(212) 643-1315	A, D, C	MIS, TECH	DT
MANAGER SOFTWARE PRODUCTS, INC.	Methodmanager	(617) 863-5800	A, D, C, T, M, E	ALL	DT, WS
MICRO FOCUS	Micro Focus COBOL Workbench	(415) 856-4161	A, D, T	MIS	DT, WS
SYSCORP INTERNATIONAL	MicroSTEP	(512) 338-5800	D, C, T, M, U	MIS	DT
SYSCORP INTERNATIONAL	MicroSTEP QS	(512) 338-5800	D, C, T, M, U	MIS	DT
SYSTEMS CONTROL TECHNOLOGY, INC.	Model - C	(415) 494-2233	A, D, C, T, M, U	TECH, RT	WS
D. APPLETON COMPANY INC.	Model Pro	(310) 374-3935	D	ALL	DT
SOFTWARE AG OF NORTH AMERICA, INC.	Natural Engineering Series	(719) 522-0304	A, D, C, T, M, U	ALL	DT, WS
PROTOSOFT, INC.	Object Plus	(713) 480-3233	A, D, C	ALL	DT
MARK V SYSTEMS	Objectmaker	(818) 995-7671	A, D, C	ALL	DT, WS,
ICONIX	ObjectModeler	(310) 458-0092	A, D, C	ALL	DT
OBJECTIVE SYSTEMS	Objectory	+46 8703-4530	A, D, T, M, U	ALL	DT, WS
ORACLE CORPORATION	OracleCASE	1-800-345-3267	A, D, C	MIS	DT, WS
WANG LABORATORIES, INC.	PACE Application builder for Windows	(508) 967-2199	D, C, M	MIS	DT
WANG LABORATORIES, INC.	PACE Dictionary Builder for Windows	(508) 967-2199	D, C, M	MIS	DT
WANG LABORATORIES, INC.	PACE Query Builder for Windows	(508) 967-2199	D, C, M	MIS	DT
WANG LABORATORIES, INC.	PACE REPORT Builder for Windows	(508) 967-2199	D, C, M	MIS	DT
PROTOSOFT, INC.	Paradigm Plus	(713) 480-3233	A, D, C, E, U	ALL	DT, WS
WINDTUNNEL SOFTWARE	Performance Architek	(312) 464-1400	D, T	ALL	DT
COMPUTER SYSTEMS ADVISERS	POSE	1-800-537-4262	A, D, U	ALL	DT
COGNOS	PowerCASE	(617) 229-6600	A, D, U	ALL	DT
ICONIX	PowerPDL	(310) 458-0092	D, C, T, M	ALL	DT
M. BRYCE & ASSOCIATES	PRIDE Information Factory	(813) 786-4567	A, D, C, T, M, U	MIS	DT
HOLLAND SYSTEMS CORPORATION	Prodeveloper	(313) 995-9595	A, D, C	ALL	DDT
INTELLICORP, INC.	ProKappa	(415) 965-5612	D, C, T, M, E	ALL	WS

Appendix A: Upper CASE Products - Product List

Vendor	Tool	Phone	Type	Target	Platforms
MCDONNELL DOUGLAS INFORMATION SYSTEMS COMPANY	Prokit* Workbench	1-800-225-7760	A, D, C, T, M	ALL	DT
MERIDIAN SOFTWARE SYSTEMS	Promod CASE Tools	(714) 727-0700	A, D, C	TECH, RT	WS
ADVANCED SYSTEM TECHNOLOGIES, INC.	QASE RT	(303) 790-4242	A, D, U	All	DT
ICONIX	QuickChart	(310) 458-0092	A, D	ALL	DT
RATIONAL	Rational Environment	(408) 496-3600	A, D, C, T, M, E, U	ALL	WS
ASCENT LOGIC CORP.	RDD-100 System Designer	(303) 740-6726	A, D, M, U	TECH	WS
SCANDURA INTELLIGENT SYSTEMS	Re/NuSys Workbench	(215) 664-1207	A, D, C, T, U	ALL	DT, WS
MARCONI SYSTEMS TECHNOLOGY	Requirements & Traceability Management (RTM)	(703) 263-1260	A, D, C, T, M	ALL	WS
DIGITAL INSIGHT	Robochart	(805) 583-3627	A, D, U	TECH	DT, WS
PROTOCOL, A DIVISION OF ZYCAD CORP.	RTrace	(201) 989-2900	A	TECH	WS
TELELOGIC	SDL Design Tool	+46 40174700	D, C	TECH, RT	DT, WS
SCIENTIFIC AND ENGINEERING SOFTWARE	SES/workbench	(512) 328-5544	D	ALL	WS
COMPUTER SYSTEMS ADVISERS	Silverrun	1-800-537-4262	A, D, U	ALL	DT
CADWARE, INC.	smartCASE	---	A, U	ALL	DT
ICONIX	SmartChart	(310) 458-0092	D, C	ALL	DT
PROCASE CORPORATION	SMARTsystem	(408) 727-0714	A, M	ALL	WS
HEWLETT-PACKARD COMPANY	Softbench/ Softbench C++	(206) 643-8784	A, D, C, T, M, E	ALL	WS
BENDER & ASSOCIATES	SOFTTEST	(415) 924-9196	A, T, U	ALL	DT
CASET CORPORATION	Software Engineering Toolkit	(714) 496-8670	A, D, C, T	ALL	WS
DELPHI GROUP	Software Engineering Environment System	---	A, D, E	TECH, RT	DT
INTERACTIVE DEVELOPMENT ENVIRONMENTS	Software Through Pictures	(415) 543-0900	A, D, C, T, M, E, U	ALL	WS
SQL*BUILDER SOFTWARE CO.	SQL*Builder	(414) 278-0500	D, C, T, M, U	ALL	DT, WS
I-LOGIX, INC.	Statemate	(617) 272-8090	A, D, C, T, M, U	TECH, RT	WS
STERLING SOFTWARE	Sterling Developer	1-800-267-9972	A, D, M, U	ALL	DT
ADVANCED TECHNOLOGY INTERNATIONAL	superCASE	(212) 947-0086	A, D, C, M, E, U	RT	WS
SYNON, INC.	Synon/2E	(415) 461-8815	A, D, C, T, M, E, U	MIS	WS
POPKIN SOFTWARE & SYSTEMS INC.	System Architect	(212) 571-3434	A, D	ALL	DT
CADWARE, INC.	System Developer I	(203) 397-2908	A, D, C, U	ALL	DT
TELEDYNE BROWN ENGINEERING	TAGS	(205) 726-1482	A, D, C, T, M	RT	WS
CADRE TECHNOLOGIES, INC.	Teamwork/ADA- ALL	(301) 897-4101	D, C	TECH, RT	WS

Software Technology Support Center

Vendor	Tool	Phone	Type	Target	Platforms
CADRE TECHNOLOGIES, INC.	Teamwork/DocGen or DPI	(301) 897-4101	A, D	ALL	WS
CADRE TECHNOLOGIES, INC.	Teamwork/IM	(301) 897-4101	A	MIS, TECH	WS
CADRE TECHNOLOGIES, INC.	Teamwork/OOA	(301) 897-4101	A, D	ALL	WS
CADRE TECHNOLOGIES, INC.	Teamwork/OOD for C++	(301) 897-4101	D, C	ALL	WS
CADRE TECHNOLOGIES, INC.	Teamwork/RqT	(301) 897-4101	A	TECH	WS
CADRE TECHNOLOGIES, INC.	Teamwork/RT	(301) 897-4101	A	TECH, RT	WS
CADRE TECHNOLOGIES, INC.	Teamwork/SA	(301) 897-4101	A	MIS, TECH	WS
CADRE TECHNOLOGIES, INC.	Teamwork/SD	(301) 897-4101	D	MIS, TECH	WS
CADRE TECHNOLOGIES, INC.	Teamwork/SIM & FSIM (5.0)	(301) 897-4101	A	TECH, RT	WS
MANAGER SOFTWARE PRODUCTS, INC.	The Manager Family	(617) 863-5800	A, D, C, T, M, U	ALL	DT, WS
+1 SOFTWARE ENGINEERING	TREESOFT 2.1	(805) 389-1778	A, D, C, T, M, E, U	ALL	WS
STRUCTSOFT	TurboCASE	(206) 644-9834	A, D	ALL	DT
VIRTUAL SOFTWARE FACTORY LTD.	Virtual Software Factory	(703) 318-1190	A, D, M, E, U	ALL	DT, WS
VISIBLE SYSTEMS, CORP.	Visible Analyst Workbench	(617) 890-2273	A, D, C, T, M, U	MIS	DT
PARCPLACE SYSTEMS, INC.	VisualWorks	(408) 481-9090	D, C, T, M	ALL	DT, WS
XINOTECH RESEARCH, INC.	Xinotech Program Composer	(612) 379-3844	D, M	MIS, TECH	DT, WS

Appendix B: Upper CASE Product Sheets

This appendix contains technology information sheets for most of the RAD tools in the tool lists. These reports provide more detailed information than the tools list. Users of these reports should be able to make preliminary tool assessments based on the provided information. Information on pricing, contact, life-cycle phases and activities, intended users, primary methodology base, hardware platforms, and general tool capabilities are included. The information has been divided into several sections. Following is a quick description of each section:

The **Product Information** and **Contact Information** sections should be self-explanatory.

The **Life Cycle Phases and Activities** section capture the intended purpose of the tool. Most tools are targeted at activities within specific phases of the software life cycle or are targeted at activities that occur across life cycle phases. The life cycle phases that are identified (Analysis, Design, Coding, and Maintenance) are generic and are not intended to imply any specific life cycle model such as waterfall or spiral. Re-engineering or reverse engineering tools are considered Maintenance tools. Several activities have been identified (e.g., Testing, Configuration Management, Documentation, and Project Management) that occur across life cycle phases. The list of activities is not meant to be all inclusive. Other activities are listed as "Other." Finally, one technology (Environments or Frameworks) that acts to connect tools that automate the various life cycle phases and activities is identified.

The **Intended Customers** section identifies the tool's intended market. Several examples of target customers such as MIS and Real-Time are listed. The "Other" category is for a tool that fills very specific market niche.

The **Primary Methodology** section addresses an issue important to the classification of analysis and design tools. Three complimentary and orthogonal views of software development methodologies have been recognized. They are object-oriented, process-oriented (structural or functional), and behavior-oriented (temporal, state-oriented, or dynamic). Each of these views takes a different perspective of the system being developed. Good development methodologies are typically concentric around one of the paradigms with support for the other two. Some tools may support multiple methodologies with differing primary paradigms.

The **Configurations** section lists the various Platforms/Operating-System on which the tool is currently available.

The **Description/Purpose** section contains free form text describing the tool.

The information in the reports was obtained either directly from the vendor or from the vendor's literature. In most cases, the vendor has supplied the information.

There are tools in the tool lists for which there is no associated technology information sheet. This condition occurs because there was insufficient available information to create the technology information sheet, either because the vendor did not supply information in time for publication or because the tool was added to the tool list too late for the creation of a technology information sheet.

The STSC can be contacted for both unpublished and updated reports that may be available.

001 Tool Suite by Hamilton Technologies Inc.

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: ---
Single User Price: \$15,000 - \$110,000

Contact Information:

Point of Contact:

Name: Margaret Hamilton
Address: 17 Inman Street
Cambridge, MA 02179
Phone Number: 617-492-0058
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Sun Workstation, HP Workstation, IBM RS/6000, DEC VAX, HP (VMS, UNIX)

Description/Purpose:

The 001 Tool Suite is an integrated automation of the 001 technology for creating reliable software and provides a development environment that supports the automatic development of ultrareliable models, simulations, and software systems by assuring that the 001 technology is used correctly. All tools within the 001 Tool Suite are object-oriented, graphical, and integrated.

AD/Vance Datamodeler by On-Line Software International

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Janet Windeknecht
 Address: Two Executive Drive
 Fort Lee, NJ 07024
 Phone Number: 201-585-6742
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
√ Coding	Requirements Management	Ada Compilers
Testing	Documentation	√ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
√ MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM 3090 (TSO, MVS/XA)

Description/Purpose:

AD/Vance Datamodeler is a TSO/ISPF mainframe-based CASE tool directed at DB2 database planning, analysis, design and construction and is intended to provide a low-risk, cost effective path to IBM's AD/Cycle. AD/Vance Datamodeler provides SQL DDL generation as well as entity-relationship (ER) diagramming and data analysis capabilities. A key feature of the product is that data integrity rules and other constraints identified in the modeling phase are enforced and passed to the SQL DDL generation phase. This helps to ensure that code generated by AD/Vance Datamodeler is accurate and complete.

ADADL by Software Systems Design, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 200
 Single User Price: \$5,000 - \$10,000

Contact Information:

Point of Contact:

Name: Thomas Radi, Ph.D.
 Address: 3627 Padua Avenue
 Claremont, CA 91711
 Phone Number: 714-625-6147
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

Structured (none)	Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh, IBM, Sun, Apollo, DEC, HP, Silicon Graphics, IBM< RS/6000,
 DEC VAX, DEC, Data General, HP (VMS, UNIX, PC/MS DOS, ULTRIX)

Description/Purpose:

ADADL (Ada Design and Documentation Language) is an Ada-based PDL that satisfies DOD directive 3405.2 requirements for a compilable Ada/PDL. The ADADL processor is a design tool and a reverse engineering tool for Ada programs. ADADL analyzes the pseudocode and actual executable Ada code to detect logic errors and to produce a "pretty printed" output report designed to simplify understanding the design. Examples of design reports are cross-referenced to usage of Ada types, objects (including set/use information) and program units, invocation trees, declaration structure, with hierarchy and interrupt reports.

AdaFlow by Iconix

Product Information:

Version Number: 1.5
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: \$995

Contact Information:

Point of Contact:

Name: Pam Johnson
 Address: 2800 28th St., Suite 320
 Santa Monica, CA 90405
 Phone Number: 310-458-0092
 Fax Number: 310-396-3454
 E-mail Address: applelink:iconix

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

Apple Macintosh

Description/Purpose:

AdaFlow supports Ada-oriented design and Ada development using Buhr/Booch style diagrams and Module Architecture Diagrams for Booch object-oriented design, an integrated dictionary, and a language sensitive editor for C++ and Ada.

ADW/Workstations by Knowledgeware Federal Sysems

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 80,000
 Single User Price: \$4,050 - \$10,750

Contact Information:

Point of Contact:

Name: Al Fox
 Address: 3340 Peachtree Road, NE
 Atlanta, GA 30026
 Phone Number: 703-506-0800
 Fax Number: 703-506-0154
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
√ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, IBM Workstations (OS/2)

Description/Purpose:

Application Development Workbench/Workstations (ADW) provides a fully integrated (but modular) PC platform for application development from planning through analysis and design to construction, including the capability to generate complete DLL statements to build DB2 databases. The major products, called workstations, that make up the ADW platform include: ADW Analysis Workstation, ADA/Design Workstation, ADW/Construction Workstation, ADW/Planning Workstation, ADW/Rapid wApplication Development Workstation, and the ADW/Documentation Workstation.

AGE by Verilog, U.S.A.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 500
 Single User Price: \$15,000 - \$30,000

Contact Information:

Point of Contact:

Name: Derek South
 Address: 3010 LBJ Freeway, Suite 900
 Dallas, TX 75234
 Phone Number: 214-241-6935
 Fax Number: 214-241-6594
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM, Sun, Apollo, DEC, HP, IBM RS/6000, DEC VAX, IBM 43xx, IBM 303/4x, IBM 308x, IBM 3090, IBM 360/370 (MVS, VM, VMS, UNIX, TSO, MVS/XA, ULTRIX)

Description/Purpose:

AGE consists of a family of tools that supports the development of telecommunications, process control, networking, real-time embedded systems, and other reactive systems. The AGE toolset supports a broad range of system development lifecycle activities including requirements analysis, global and detail systems analysis and design, coding, unit and integration testing, and system validation. Among other capabilities, the toolset provides capabilities for modeling, simulation, prototyping, the automatic generation of source code, and the automatic generation of system validation test scenarios.

Aion Development System by Trinzic Corporation

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 600
 Single User Price: \$7,000

Contact Information:

Point of Contact:

Name: Alan Codkind
 Address: 138 Technology Drive
 Waltham, MA 02254
 Phone Number: 617-891-6500
 Fax Number: 617-893-5681
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
√ Coding	Requirements Management	Ada Compilers
√ Testing	Documentation	Databases
√ Maintenance	Simulation	Process Technologies
√ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, IBM 43xx, IBM 303/4x, IBM 308x, IBM 3090, IBM 360/370, Amdahl, NAS(MVS, VM, TSO, CMS, CICS, PC/MS DOS, MVS/XA, OS/2)

Description/Purpose:

The Aion Development System (ADS) is a knowledge-based system for building and maintaining mainstream production applications. It provides a full-function development environment composed of a knowledge base containing object-oriented data modeling and processing capabilities and declarative structures for representing rules and nonprocedural processing. The development environment also contains a distinctive developer's toolkit with intelligent, structured editors, debuggers, change management facilities and an inference engine that dynamically determines the logic flow through the application.

ANATOOL *by Advanced Logical Software*

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: --- Number Sold: --- Single User Price: \$694 - \$925	Contact Information: Point of Contact: Name: Pierre Delastre Address: 9903 Santa Monica Blvd. Suite 108 Beverly Hills, CA 90212 Phone Number: 213-653-5786 Fax Number: --- E-mail Address: ---
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Lifecycle Phases and Activities:		
✓ Analysis ✓ Design Coding Testing Maintenance Environment Other:	Configuration Management Project Management Requirements Management Documentation Simulation Quality Assurance	Metrics Reuse Ada Compilers Databases Process Technologies Reengineering

Intended Customers:		
✓ All MIS	Technical (Engineering) Real-time	Hard Real-time: Other:

Primary Methodology:		
✓ Structured	Object-Oriented	Behavior-Oriented

Configurations:
Apple Macintosh

Description/Purpose:
<p>ANATOOL is a toolkit that automates Structured Systems Analysis Methodology, SSA, (Yourdon, DeMarco, Gane/Sarson) on the Macintosh. The product includes a graphics tool to draw data diagrams, a data dictionary, and a pseudocode generator to write specifications.</p>

AS/SET by System Software Associates, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: January 1990
 Number Sold: 1,500
 Single User Price: \$20,000 - \$100,000

Contact Information:

Point of Contact:

Name: Gary Daichendt
 Address: 500 W. Madison
 Chicago, IL 60661
 Phone Number: 312-641-2900
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS), IBM Workstation, IBM AS/400 (OS/400)

Description/Purpose:

AS/SET is an integrated, repository-based CASE environment for the AS/400 system. It incorporates a 4GL of which source code output can be modified by the user. AS/SET includes character-based tools for data modeling, action diagramming and screen and report painters. It supports the reuse of predefined objects including common programming tasks provided by AS/SET as well as user-defined objects.

Auto-G by RJO Enterprises, Inc.

Product Information:

Version Number: 3.6
 Date of Last Release: August 1991
 Date of First Release: February 1986
 Number Sold: 27
 Single User Price: \$27,000

Contact Information:

Point of Contact:

Name: James Dempsey
 Address: 4500 Forbes Boulevard
 Lanham, MD 21114
 Phone Number: 301-731-6875
 Fax Number: 301-731-3626
 E-mail Address:

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	Metrics
✓ Design	Project Management	✓ Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	✓ Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

Sun 3/4 (UNIX, Sun-Windows), HP 9000 (UNIX, X-Windows) IBM RS/6000
 (AIX, X-Windows), OKI-Station 7300 (UNIX, X-Windows), DEC-Station 3100
 (ULTRIX, S-Windows) VAX-Station 3100 (VMS)

Description/Purpose:

Auto-G is a lifecycle CASE toolset with a rigorously defined representation symbology capable of representing all kinds of structures, information flow and behavior in any combination. The symbology is used to represent the progression through requirements analysis, design, implementation, and maintenance in a seamless manner. Complete and consistent designs may be used as input for automated generation of compilable and executable code. Maintenance is at the design level and not at the code level. The symbology and the Auto-G toolset is capable of supporting both structured, object-oriented, object-based, and behavior-oriented methodologies.

Axiom-SE by STG, Inc.

Product Information:

Version Number: 2.2
Date of Last Release: February 1993
Date of First Release: November 1991
Number Sold: 700
Single User Price: \$1,495 - \$4,995

Contact Information:

Point of Contact:

Name: Vince Peterson
Address: 18075 Ventura Blvd.
Encino, CA 91316
Phone Number: 1-800-959-2451
Fax Number: 819-609-8935
E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
√ Coding	√ Requirements Management	Ada Compilers
Testing	√ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured	√ Object-Oriented	Behavior-Oriented
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Configurations:

Sun, HP, IBM PC

Description/Purpose:

Axiom-SE provides a software development environment, supporting requirements analysis, requirements tracing, architectural and detailed design for Ada and C, code generation for Ada and C, and automated documentation generation. Axiom's comprehensive support for structured or object-oriented methods promotes the use of disciplined, engineering approach to software development.

BACHMAN/Analyst by Bachman Information Systems**Product Information:**

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: \$10,000

Contact Information:**Point of Contact:**

Name: Steven Guthrie
 Address: 8 New England Exec. Park
 Burlington, MA 01803
 Phone Number: 617-273-9003
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (OS/2), IBM Workstation

Description/Purpose:

BACHMAN/Analyst is a member of the Bachman/Re-Engineering Product Set. It provides information modeling and data analysis capabilities as well as process and logic modeling capabilities to assist analysts in developing models of the business under study, which may encompass all or part of an organization. The product creates actual logic specifications that drive DB2 and other relational database designs as well as the generation of production applications. The models created in BACHMAN/Analyst are synchronized with the rest of the BACHMAN product set, which means that changes in one tool are reflected in the other tools.

BLUES by Advanced Logical Software

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 9,000
 Single User Price: \$1,875 - \$12,300

Contact Information:

Point of Contact:

Name: Pierre Delastre
 Address: 9903 Santa Monica Blvd.
 Suite 108
 Beverly Hills 90212
 Phone Number: 213-653-5786
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
√ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	√ Technical (Engineering)	Hard Real-time:
√ MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

BLUES (Better Logic Using Expert Software) is a set of software modules that support system development and maintenance, and which are designed for integrated or independent use in an Apple Macintosh environment. This CASE toolset uses the full graphics potential of the Macintosh to generate a broad range of diagrams and flowcharts. It provides on-line guidance in the proper use of techniques and automatically checks whether the diagrams and flowcharts are consistent. It generates pseudocode and incorporates a variety of facilities that simplify screen generation and report design.

BON OOAD Methodology by Interactive Software Engineering, Inc.

Product Information:

Version Number: ---
 Date of Last Release: January 1993
 Date of First Release: May 1991
 Number Sold: ---
 Single User Price: \$1,995

Contact Information:

Point of Contact:

Name: Darcy Harrison
 Address: 270 Storke Road, Suite 7
 Goleta, CA 93117
 Phone Number: 805-685-1006
 Fax Number: 805-685-6869
 E-mail Address: darcy@eiffel.com

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	✓ Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	✓ Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

SUNSPARC, Sun 3, Sun 4, IBM RS/6000, MIPS, Apollo DN, 386/486 (ESIX, AT&T), Silicon Graphics, Sony, VAX (ULTRIX, VMS), DECstation (ULTRIX), HP (UX), 386/486 SCO-ODT, NeXT, Apple A/UX and other 88 open platforms.

Description/Purpose:

A TOOL AND A METHOD. BON ("The Better Object Notation") provides a clear notation and a set of methodological guidelines for high-level analysis and design, in the Eiffel spirit of precision, scalability and clarity. BON uses a well defined set of conventions, supports semantics, i.e., assertions, contracts, class invariants), not just structure. Either textual or graphical elements can be used and manipulated. The BON notation is fully supported by the EiffelCase analysis and design workbench. EiffelCase is an object-oriented analysis and design environment that covers the full lifecycle for software modeling, architectural design, and user-developer communication.

CA-DB:Architect by Computer Associates International

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: - --
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Maria Barringhaus
 Address: 1 Computer Associates Plaza
 Islandia, NY 11788
 Phone Number: 1-800-645-3003
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

CA-DB:Architect uses icon-driven graphic techniques to provide users with the capability to generate and edit application and database designs as well as documentation details. The product is integrated with the CA-IDMS/DB and CA-ADS family of data management and software engineering tools and provides support for business requirements planning, logical database design, physical database design, and application design. With respect to business requirements planning, the tool provides graphic and textual information on an organization's existing systems, deficiencies in those systems, and proposed system enhancements.

CARDtools by CARDtools Systems Corporation

Product Information:

Version Number: 4.0
 Date of Last Release: December 1992
 Date of First Release: September 1987
 Number Sold: 375
 Single User Price: \$7,000 - \$27,000

Contact Information:

Point of Contact:

Name: Beth McGee
 Address: 333 Cobalt Way, Suite 107
 Sunnyvale, CA 94086
 Phone Number: 408-559-4240
 Fax Number: 408-559-4246
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
✓ Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	✓ Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

Sparc (Open Windows 3.0, O/S 4.1.x, Solaris 2.0), Sun 3/4 (Sunview, O/S 4.1.x),
 DEC (VMS 5.x or greater)

Description/Purpose:

CARDtools is an integrated set of CASE tools designed to support complex software projects for real-time and embedded microprocessor systems. Features dedicated to true real-time needs include timing simulation, tasking diagrams, target and real-time operating system knowledge, hardware/software interface specifications, and PDL with real-time constructs. Other capabilities include: data and control flow diagrams, state transition diagrams, functional decomposition diagrams, data dictionary, traceability, and 2167A documentation generation.

CASEware Modeller by AD/Consultants

Product Information:

Version Number: 2.3
Date of Last Release: June 1992
Date of First Release: 1990
Number Sold: 500
Single User Price: \$6,316

Contact Information:

Point of Contact:

Name: Steve Loveridge
Address: 12000 N. Dale Mabry HW,
Suite 226
Tampa, FL 33618
Phone Number: 813-265-3708
Fax Number: 813-265-3028
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	✓ Other: Business Analysts

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (UNIX, PC/MS DOS, OS/2, Microsoft Windows)

Description/Purpose:

The CASEware Modeller is a second-generation open-architecture business reengineering tool that runs on a LAN under OS/2 2.x or Microsoft Windows 3.x. Modeller's client-server architecture allows a development workgroup to concentrate on analysis and design, sharing and reusing objects on a normalized repository. CASEware Modeller implements Entity-Relationship, Decomposition, Matrix and Process Dynamics Modeling techniques

Chen Workbench by Chen & Associates, Inc.

Product Information:

Version Number: 2.11
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 1,000
 Single User Price: \$295 - \$5,995

Contact Information:

Point of Contact:

Name: Dave Hewins
 Address: 4884 Constitutional Ave.
 Suite 1-E
 Baton Rouge, LA 70808
 Phone Number: 504-928-5765
 Fax Number: 504-928-9371
 E-mail Address:

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

CASE tool to support database application development, database design, database migration, and client-server development. It supports forward and reverse engineering of over 30 DBMSs. Consulting, seminars, and methodology training services are available.

CICS SPII by Flexus International Corporation

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 900
 Single User Price: \$795 - \$995

Contact Information:

Point of Contact:

Name: Robert T. Wolfe
 Address: P.O. Box 640
 Bangor, PA 18013
 Phone Number: 215-588-9400
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
√ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, IBM Workstations, Sun Workstation, DEC Workstation, HP Workstation (PC/MS DOS, OS/2, UNIX)

Description/Purpose:

CICS SPII allows CICS programmers to utilize MS-DOS, OS/2, or UNIX workstations to design and prototype end-user interfaces for mainframe-based command level CICS COBOL applications, thereby avoiding the traditional problems associated with developing interactive data entry programs directly on the mainframe. CICS SPII enables users to design user interfaces for applications before writing any COBOL code. The screen components of the user interfaces can be incorporated into a working system model and prototyped at the workstation level.

COBOL SPII by Flexus International Corporation

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 2,800
 Single User Price: \$495 - \$795

Contact Information:

Point of Contact:

Name: Robert T. Wolfe
 Address: P.O. Box 640
 Bangor, PA 18013
 Phone Number: 215-588-9400
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, IBM Workstations, Sun Workstation, DEC Workstation, HP Workstation (PC/MS DOS, OS/2, UNIX)

Description/Purpose:

COBOL SPII is an interactive screen management system designed for the professional COBOL programmer. It allows programmers to design modern text mode end-user interfaces incorporating such features as scrolling, mouse support, scroll bars, action bars, and other IBM SAA/CUA compatible features. The text mode interface may be migrated transparently from MS-DOS or OS/2 text mode to OS/2 Presentation Manager or Microsoft Windows 3.0 Graphical User Interface mode, thereby enabling the COBOL programmer to have one application that supports both text mode and GUI mode.

Corvision by Cortex Corporation

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: --- Number Sold: 550 Single User Price: \$30,000 - \$325,000	Contact Information: Point of Contact: Name: Director of Marketing Address: 100 Fifth Avenue Waltham, MA 02154 Phone Number: 617-622-1900 Fax Number: --- E-mail Address: ---
--	--

Lifecycle Phases and Activities:		
✓ Analysis ✓ Design ✓ Coding ✓ Testing ✓ Maintenance ✓ Environment Other:	Configuration Management Project Management ✓ Requirements Management Documentation Simulation Quality Assurance	Metrics Reuse Ada Compilers Databases Process Technologies Reengineering

Intended Customers:		
All ✓ MIS	Technical (Engineering) Real-time	Hard Real-time: Other:

Primary Methodology:		
✓ Structured	Object-Oriented	Behavior-Oriented

Configurations:
IBM XT/AT/PS2 (PC/MS/DOS), DEC VAX (VMS, UNIX, ULTRIX)

Description/Purpose:
<p>Corvision is an integrated application development environment that uses I-CASE technology for the development of multiuser, medium to large, business critical MIS applications for the DEC VAX/VMS environment and incorporates a repository-based application generator capability. Corvision automates the major activities of the software lifecycle, from system design, through specification and generation, to on-going maintenance and enhancement. The product employs diagramming and painting tools on a PC workstation, close-coupled with an application generator on the VAX.</p>

Ctrl-C by Systems Control Technology, Inc.

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: 1982 Number Sold: 300 Single User Price: ---	Contact Information: Point of Contact: Name: Carol Michaels Address: 2300 Geng Road P.O. Box 10180 Palo Alto, CA 94303-0888 Phone Number: 415-494-2233 Fax Number: 415-496-6595 E-mail Address: cae_sales@sct.com
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Lifecycle Phases and Activities:		
✓ Analysis ✓ Design ✓ Coding ✓ Testing ✓ Maintenance Environment Other:	Configuration Management Project Management Requirements Management ✓ Documentation Simulation Quality Assurance	Metrics Reuse Ada Compilers Databases Process Technologies Reengineering

Intended Customers:		
All MIS	✓ Technical (Engineering) Real-time	Hard Real-time: Other:

Primary Methodology:		
✓ Structured	Object-Oriented	Behavior-Oriented

Configurations:
VAX/VMS, UNIX, Aegis, PC/DOS, ULTRIX, Sun/OS, Apollo, Convex

Description/Purpose:
<p>Ctrl-C is an interactive language for the analysis and design of multivariable control systems, system identification, and signal processing. Functions are included for most classical and modern control design techniques. Systems may be described in state space or transfer function and in continuous or discrete time forms. Transformations between representations are simple and straightforward. A powerful matrix environment provides a workbench for system simulation, signal processing, optimization, and matrix analysis.</p>

Data-Station by Charles River Development

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: 1988
Number Sold: 50
Single User Price: \$6,000 - \$100,000

Contact Information:

Point of Contact:

Name: Paul Grieco
Address: 483 Beacon Street
Boston, MA 02115
Phone Number: 617-424-1820
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	✓ Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	✓ Other: DBAs and Sys Analysts

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

DEC VAX, IBM PS/2, IBM 5/3xx, IBM PC, SUN 3/4 (MS DOS, MVS, OS/2, UNIX, VM, VMS)

Description/Purpose:

Data-Station is a combination of an integrated host/server dictionary repository built on the Oracle relational database management system, a CASE graphics system based on the AutoCAD professional CAD graphics environment, and an application generator based on the TOP*CASE System from Comtecno B.V. of Holland. The product is targeted at data administrators, database designers, and systems analysts working in multiplatform SQL environments. Data-Station can be used to prepare process and data models, module structure charts, flowcharts, communications network layouts, database schemas, entity-relationship ('ER') models, and block diagrams. It can be operated across heterogeneous hardware platforms and can run in a client/server environment to support project workstations.

DataModeler by Iconix

Product Information:

Version Number: 1.1
Date of Last Release: ---
Date of First Release: ---
Number Sold: ---
Single User Price: \$995

Contact Information:

Point of Contact:

Name: Pam Johnson
Address: 2800 28th St., Suite 320
Santa Monica, CA 90405
Phone Number: 310-458-0092
Fax Number: 310-396-3454
E-mail Address: applelink:iconix

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

DataModeler supports Chen, Martin, and IDEF1X Data Modeling and for Schlaer, Mellor object-oriented analysis and includes an Entity Relationship Attribute (ERA) Diagram Editor, Data Dictionary, and Language Sensitive Editor.

DataViews by V.I. Corporation

Product Information:

Version Number: 9.2
Date of Last Release: August 1992
Date of First Release: 1986
Number Sold: 12,000
Single User Price: \$17,700

Contact Information:

Point of Contact:

Name: Michael Ticse
Address: 2465 East Bayshore, Suite 301
Palo Alto, CA 94303
Phone Number: 415-493-9222
Fax Number: 415-493-9231
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	✓ Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	✓ Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

Sun, HP, SGI, DEC VAX, IBM RS/6000, CONCURRENT, 88OPEN, DATA
GENERAL AVION, HARRIS NIGHTHAWK, ENCORE, MOTOROLA

Description/Purpose:

DataViews is a Dynamic Visualization Tool (DDVT) for creating on-line, real-time, mission-critical applications. This tool will help you build a graphical front end to a variety of applications. Ideally suited for graphical monitoring and control applications with thousands of variables and data points, DataViews is used extensively in Aerospace, Process Control, Scada, Network Monitoring, and C3I. DataViews cuts development time and reduces time to market.

Deft by SQL Solutions, Inc.

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: --- Number Sold: 700 Single User Price: \$4,500 - \$7,900	Contact Information: Point of Contact: Name: Karen Crowley Address: 8 New England Exec. Park Burlington, MA 01803 Phone Number: 617-270-4150 Fax Number: --- E-mail Address: ---
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Lifecycle Phases and Activities:

<input checked="" type="checkbox"/> Analysis <input checked="" type="checkbox"/> Design Coding Testing Maintenance Environment Other:	Configuration Management Project Management Requirements Management Documentation Simulation Quality Assurance	Metrics Reuse Ada Compilers <input checked="" type="checkbox"/> Databases Process Technologies <input checked="" type="checkbox"/> Reengineering
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Intended Customers:

All <input checked="" type="checkbox"/> MIS	Technical (Engineering) Real-time	Hard Real-time: Other:
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Primary Methodology:

<input checked="" type="checkbox"/> Structured	Object-Oriented	Behavior-Oriented
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Configurations:

 Apple Macintosh, Microsoft Windows

Description/Purpose:

 Deft is a Macintosh-based set of tools that specifically addresses analysis, design, and schema generation for relational database management system (RDBMS) applications. The toolset, which includes multiple editors, a design compiler, and gateways to various target environments, provides capabilities for both forward and reverse engineering RDBMS applications.

Design Generator by Computer Sciences Corporation

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: --- Number Sold: 150 Single User Price: \$995	Contact Information: Point of Contact: Name: Wayne Kelley Address: 3170 Fairview Park Drive Falls Church, VA 22042 Phone Number: 703-876-1223 Fax Number: --- E-mail Address: ---
---	--

Lifecycle Phases and Activities:		
✓ Analysis ✓ Design Coding Testing Maintenance Environment Other:	Configuration Management Project Management Requirements Management Documentation Simulation Quality Assurance	Metrics Reuse Ada Compilers Databases Process Technologies Reengineering

Intended Customers:		
✓ All MIS	Technical (Engineering) Real-time	Hard Real-time: Other:

Primary Methodology:		
✓ Structured	Object-Oriented	Behavior-Oriented

Configurations:
IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:
<p>Design Generator supports the requirements analysis, preliminary design, and detailed design phases of the software development lifecycle. The tool provides data flow diagrams, entity-relationship attribute diagrams, state transition diagrams, and structure charts automatically capturing and maintaining significant amounts of data dictionary information. The tool supports analysts and designers in developing structured specifications and automatically transforms them into a structured design. The tool can also be used to measure the complexity of software designs.</p>

Design/CPN by Meta Software Corp.

Product Information:

Version Number: 1.9.1
 Date of Last Release: November 1992
 Date of First Release: May 1989
 Number Sold: 100
 Single User Price: \$24,000

Contact Information:

Point of Contact:

Name: Bob Seltzer
 Address: 125 Cambridge Park Drive
 Cambridge, MA 02140
 Phone Number: 617-576-6920
 Fax Number: 617-661-2008
 E-mail Address: avl@metasoft.com

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other: Process Modeling, Business Improvement		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other: Operational Managers

Primary Methodology:

Structured	Object-Oriented	✓ Behavior-Oriented
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Configurations:

Macintosh OS, MS Windows, Sun SPARC, HP9000

Description/Purpose:

Design/CPN provides simulation capabilities to design and analyze real-time systems, complex transaction processing, enterprise modeling, and other functions for business process redesign (BPR). The product combines the design features of CASE tools with the executability of simulation technology and rests on the formal principles of hierarchical Colored Petri nets (CP-nets). The CP-net model has structuring facilities that make it possible to study behavioral issues such as concurrency, deadlock or safety in real-world situations, plus timing and costing. Design/CPN consists of an editor, simulator, reporting and animation facilities, application generator, and open architecture for importing diagrams.

Design/IDEF by Meta Software Corp.

Product Information:

Version Number: 2.5
 Date of Last Release: January 1993
 Date of First Release: November 1987
 Number Sold: 1,000
 Single User Price: \$3,995

Contact Information:

Point of Contact:

Name: Andrew Levin
 Address: 125 Cambridge Park Drive
 Cambridge, MA 02140
 Phone Number: 617-576-6920
 Fax Number: 617-661-2008
 E-mail Address: avl@metasoft.com

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	√ Process Technologies
Environment	Quality Assurance	Reengineering
Other: Process Modeling, Business Improvement		

Intended Customers:

All	√ Technical (Engineering)	Hard Real-time:
√ MIS	Real-time	Other: Operational Managers

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Macintosh OS, MS Windows, Sun SPARC, HP9000

Description/Purpose:

Design/IDEF is an automated IDEF modeling tool. The product provides advanced interactive graphical support for System Requirements Modeling (IDEF0/SADT), data modeling (IDEF1X), and behavioral modeling (IDEF/CPN). Behavioral models built with the product can be directly exported to Design/CPN, Meta Software's simulation tool, for system analysis. Design/IDEF uses one directly executable graphics model during the requirements, specification, design and implementation phases of system development. Design/IDEF will support multiple members of a project team working simultaneously on a large complex IDEF0 model. The product has a built-in data dictionary that allows users to store additional information about activities or ICOM's.

DesignAid II by YOURDON/CGI Systems Inc.

Product Information:

Version Number: 1.0
 Date of Last Release: October 1992
 Date of First Release: October 1992
 Number Sold: 8,000
 Single User Price: \$1,295

Contact Information:

Point of Contact:

Name: Marketing
 Address: 8521 Six Forks Road
 Raleigh, NC 27615
 Phone Number: 919-847-9508
 Fax Number: 919-847-2457
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
✓ Maintenance	✓ Simulation	✓ Process Technologies
Environment	✓ Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

DesignAid II is a CASE tool to fully support Yourdon Structured Method for information and real-time systems. Full analysis and design support. DesignAid II is a PC-based CASE product with a true multiuser repository. It supports process modeling, data modeling, Ward-Mellor, and Hatley techniques for real-time.

DESIGNGEN by Software Systems Design, Inc.

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 10
Single User Price: \$7,500 - \$8,500

Contact Information:

Point of Contact:

Name: Thomas Radi, Ph.D.
Address: 3627 Padua Avenue
Claremont, CA 91711
Phone Number: 714-625-6147
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh, IBM, Sun, Apollo, DEC, HP, IBM RS/6000, DEC VAX, DEC, Data General, HP (VMS, UNIX, PC/MS DOS, ULTRIX)

Description/Purpose:

DESIGNGEN (formerly called ARIS) is a set of software programs that automatically produce Ada code representing a top level Ada design. The design is constructed automatically by analyzing the software requirements as specified in a structured analysis database and creating a suitable object-oriented top-level design using a combination of algorithms suggested by Booch, Gomaa, and Shumate. The DESIGNGEN tool works in conjunction with Cadre/Teamwork, IDE/Software through Pictures, and Intersolv's Excelerator.

Developer's Assistant (DAISys) by S-Cubed, Inc.

Product Information:

Version Number: 1.3.1
 Date of Last Release: August 1992
 Date of First Release: October 1991
 Number Sold: 146
 Single User Price: \$6,000

Contact Information:

Point of Contact:

Name: John Rade
 Address: 1010 Washington Boulevard
 Stamford, CT 06901
 Phone Number: 203-323-0760
 Fax Number: 203-323-2007
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	✓ Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
✓ Other: Modeling, Impact Analysis		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	✓ Real-time	✓ Other: Business and Operational Analysts

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows, OS/2)

Description/Purpose:

DAISys is a new generation of information system development tools. DAISys covers the full life-cycle, including for the first time, the gathering and refinement of end-user requirements, and can be used to deliver client-server and mainframe applications rapidly from the same requirement specification. DAISys uses expert system technology and an object-oriented approach to development, combining the technical and procedural strengths of traditional CASE with the ease of use and end-user focus of today's leading client/server application development tools. System requirements are defined in ordinary business terms and converted to working code. Along the way, the system performs numerous traceability and integrity checks, produces graphical and narrative documentation, and provides a functional simulation of the system prior to the automatic generation of code.

DOORS by Quality Systems and Software

Product Information:

Version Number: 1.1
 Date of Last Release: 1 January 1993
 Date of First Release: 1 June 1992
 Number Sold: 10
 Single User Price: \$8,000

Contact Information:

Point of Contact:

Name: Paul Robinson
 Address: Churcham House
 1 Bridgeman Road,
 Teddington,
 Middlesex, TW119AJ, UK
 Phone Number: +44 81 977 8781
 Fax Number: +44 81 942 3016
 E-mail Address: 100023.44@compuserve.com

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	✓ Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Sun (Sun OS)

Description/Purpose:

DOORS (Dynamic Object-Oriented Requirements System) is a tool for customers to create and manage requirements in a structured way throughout the lifecycle. DOORS is a requirements quality manager that works for software and systems development. The major structures (product, development, verification) can all be constructed and interrelated; giving traceability throughout the lifecycle, DOORS is the first WYSIWYG requirements tool and uses a graphical user interface.

EasyCASE Plus by Evergreen CASE Tools, Inc.

Product Information:

Version Number: 3.2
 Date of Last Release: 1 December 1992
 Date of First Release: 1991
 Number Sold: 4,000
 Single User Price: \$795

Contact Information:

Point of Contact:

Name: Brian Hansford
 Address: 8522 154th Avenue NE
 Redmon, WA 98052
 Phone Number: 206-881-5149
 Fax Number: 206-883-7676
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM PC or compatible (MS-DOS 3.3 or higher)

Description/Purpose:

EasyCASE Plus Developer's Edition does analysis and design on a PC and allows you to export database schemas to larger production machines. You can reverse engineer dBase tables and indexes to ERD entities and record the element structures. A schema generator is included to transform your diagrams and data dictionary entries into either of the following database schema formats: dBase III data file headers, index files, and memo files and SQL DDL (Data Definition Language) database creation scripts.

EasyCASE Professional by Evergreen CASE Tools, Inc.

Product Information:

Version Number: 3.2
 Date of Last Release: 1 December 1992
 Date of First Release: 1991
 Number Sold: 5,000
 Single User Price: \$649

Contact Information:

Point of Contact:

Name: Brian Hansford
 Address: 8522 154th Avenue NE
 Redmon, WA 98052
 Phone Number: 206-881-5149
 Fax Number: 206-883-7676
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM PC or compatible (MS-DOS 3.3 or higher)

Description/Purpose:

EaseCASE Professional is a full-featured CASE tool. It puts all of the well-known development methodologies, diagram types, and symbol sets for structured analysis, design, and data information modeling at your fingertips. It is a project specification tool that uses the integrated dBase III format data dictionary to describe your chart objects. It uses the Data Dictionary and Reports Manager to query and maintain the data dictionary and produce reports for project documentation. It is a verification tool that uses the integrated analysis features to verify the consistency and completeness of your charts and data dictionary.

Ensemble for C by Cadre Technologies, Inc.**Product Information:**

Version Number: 5.0
 Date of Last Release: June 1993
 Date of First Release: June 1992
 Number Sold: 150
 Single User Price: \$3,850

Contact Information:**Point of Contact:**

Name: Doug Trolan
 Address: 19545 NW Von Neumann Dr.
 Beaverton, OR 97006
 Phone Number: 301-897-4101
 Fax Number: 301-897-3106
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	√ Metrics
√ Design	Project Management	√ Reuse
√ Coding	Requirements Management	Ada Compilers
√ Testing	√ Documentation	Databases
√ Maintenance	Simulation	Process Technologies
Environment	√ Quality Assurance	√ Reengineering
Other:		

Intended Customers:

All	√ Technical (Engineering)	Hard Real-time:
√ MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Sun (Sun OS or Solaris), HP (HP UX), RS6000 (AIX), DEC (ULTRIX)

Description/Purpose:

Ensemble is a modular tool suite that helps automate software development and maintenance of C code. Ensemble-System Understanding: Reverse engineers C code into Structure Charts while fully populating the CASE database. Ensemble-Function Understanding: Reverse engineers C code functions into flowcharts and calculates cyclomatic complexity and data complexity metrics. Ensemble-Documentation: Provides table of contents and page numbers for automated output from the Ensemble database. Ensemble-Construction: Forward engineers the fully populated CASE database into C source files. Provides control for file packaging and C dialect support. Ensemble-Test Case Generation: Automatically generates black box test cases for C functions. Ensemble-Test Verification: Automatically generates code and path coverage analyses.

Envision by Future Tech Systems, Inc.

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 650
Single User Price: \$7,500 - \$9,000

Contact Information:

Point of Contact:

Name: John Howland
Address: 824 East Main Street
Auburn, WA 98002
Phone Number: 206-939-7552
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured √ Object-Oriented √ Behavior-Oriented

Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2, Microsoft Windows)

Description/Purpose:

Envision is a multiuser Upper CASE system that provides a flexible, methodology-independent environment for software analysis and design. The key feature of the product is its flexibility, which is attributable to the object-oriented repository and meta CASE constructs used. Envision sets no limits on attribute contents, repository views, interfaces to other tools, number of items on a diagram, size of diagram versus virtual sheet of paper, number of users with simultaneous access to the database.

EPOS/RE-SPEC by SPS Software Products and Services

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Marketing Department
 Address: 14 East 38th Street, 14th Floor
 New York, NY 10016
 Phone Number: 212-686-3790
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	✓ Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	✓ Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, Apple Macintosh, IBM, HP, DEC VAX, Data General, IBM 43xx, IBM 360/370 (DOS (mainframe), MVS, VM, VMS, UNIX, TSO, CMS, PC/MS DOS)

Description/Purpose:

EPOS (Engineering and Project management-Oriented Support) is designed to assist engineers, designers, managers and quality assurance personnel in complex system development projects. EPOS automates documentation, including graphical charting and reporting according to government or in-house standards, automatically generates code for Ada, Pascal and Fortran, and provides project management assistance.

Erwin/SQL by Logic Works Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 1,400
 Single User Price: \$995 - \$1,495

Contact Information:

Point of Contact:

Name: Barbara Bogart
 Address: 214 Carnegie Center
 Princeton, NJ 08540
 Phone Number: 609-683-0054
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows)

Description/Purpose:

Erwin/SQL is an entity-relationship ('ER') logical data modeling tool that operates under Microsoft Windows 3.0 and is designed to support users who designing or document relational databases in SQL (or in Xbase). The product enables the user to create large, detailed diagrams. In the schematics used by Erwin/SQL, boxes represent entities and attributes (fields) and are listed within the boxes, while connecting lines superimposed with action verbs represent relationships. Descriptive information can be incorporated anywhere within the model. Furthermore, no limit is placed on the size of the model; a single file can contain hundreds of entities and thousands of attributes.

Excelerator Series by Intersolv

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 35,000
 Single User Price: \$9,500

Contact Information:

Point of Contact:

Name: Marketing Department
 Address: 3200 Tower Oaks Boulevard
 Rockville, MD 20852
 Phone Number: 1-800-547-4000
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2 Microsoft Windows)

Description/Purpose:

The Excelerator Series is a set of Upper CASE products designed for automating the systems planning, analysis, and design phases of the system development cycle. The products provide a "front-end" to Intersolv's APS Series. The Excelerator Series is made up of three major products, PC Prism, Excelerator, and 4Front.

EXPERT/CIO by P-Cube Corporation

Product Information:

Version Number: 3
 Date of Last Release: 1992
 Date of First Release: 1989
 Number Sold: ---
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Joseph Napoli
 Address: 572 E. Lambert Road
 Brea, CA 92621
 Phone Number: 714-990-3169
 Fax Number: 714-990-0838
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	√ Metrics
Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	√ Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
√ Other: Strategic/Tactical Planning		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
√ MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

EXPERT/CIO provides a metrics-based framework for both strategic and tactical information systems planning and project selection. It directly links decisions on information technology to an organization's goals and objectives and can simulate the impact of new systems, the reengineering of existing systems, and the migration to new technologies. The cornerstone of the system is a well-defined methodology for surfacing and measuring information improvement opportunities and measuring the degree to which proposed information technology solutions will address those opportunities.

Exsys by Jordan-Webb Info Systems, LTD.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 40
 Single User Price: \$6,000 - \$40,000

Contact Information:

Point of Contact:

Name: Paul Collins
 Address: 3700 West Devon Ave.
 Suite F
 Lincolnwood, IL 60659-9928
 Phone Number: 708-673-2288
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh, DEC VAX, Data General (VMS, UNIX)

Description/Purpose:

Exsys provides a complete environment in which to build, maintain, and run systems at the specification level. Through modeling, the Exsys Development System combines the conventional activities of analysis, design, testing, and documentation into a single step. The system requirements are obtained from statements of fact in plain English, stored, cross-referenced as items in a normalized, relational database called the System Model.

ezX by Sunrise Software International

Product Information:

Version Number: 3.2
Date of Last Release: December 1992
Date of First Release: January 1990
Number Sold: ---
Single User Price: \$3,500

Contact Information:

Point of Contact:

Name: Fred Sells
Address: 170 Enterprise Center
Middletown, RI 02840
Phone Number: 401-847-7868
Fax Number: 401-847-7879
E-mail Address: fred@sunrise.com

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	✓ Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS), Sun SPARC (Sun OS), DEC VAX (VMS), DEC RISC (ULTRIX), IBM RS/6000 (AIX), SGI (IRIX), HP (HP-UX)

Description/Purpose:

ezX is a GUI rapid prototyping and development tool.

FastTask by Iconix

Product Information:

Version Number: 2.3
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: \$995

Contact Information:

Point of Contact:

Name: Pam Johnson
 Address: 2800 28th St., Suite 320
 Santa Monica, CA 90405
 Phone Number: 310-458-0092
 Fax Number: 310-396-3454
 E-mail Address: applelink:iconix

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

FastTask provides real-time extensions (Ward-Mellor, Hatley) in State Transition Diagrams and their equivalent matrix representations, supports Schlaer/Mellor, Rumbaugh, Coad/Yourdon, and Booch object-oriented methods.

Foresight by Nu Thena Systems, Inc.

Product Information:

Version Number: 2.25
Date of Last Release: March 1993
Date of First Release: January 1989
Number Sold: ---
Single User Price: \$25,000

Contact Information:

Point of Contact:

Name: Howard Kanner
Address: 1430 Spring Hill Road, #210
McLean, VA 22102
Phone Number: 703-356-5056
Fax Number: 703-356-1260
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
Maintenance	✓ Simulation	✓ Process Technologies
Environment	Quality Assurance	Reengineering
✓ Other: Prototyping		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

Sun SPARC (OS 4.1.X)

Description/Purpose:

Foresight is a desktop modeling and simulation tool for rapidly prototyping real-time systems. Foresight allows the user to capture system requirements with a rigorous graphical notation. Executable specifications are constructed using block diagrams, state transition diagrams, and procedures. Foresight ensures requirements are correct through the simulation of specifications, and identifies design errors.

Foundation Vista by Menlo Business Systems

Product Information:

Version Number: 4.1
Date of Last Release: February 1992
Date of First Release: January 1988
Number Sold: ---
Single User Price: \$7,900

Contact Information:

Point of Contact:

Name: Frank Bellafore
Address: 201 Main Street
Los Altos, CA 94022
Phone Number: 415-948-7920
Fax Number: 415-949-6655
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	✓ Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

Foundation Vista features a complete set of fully integrated Application Design Editors, that enable you to design, document, and define an application with unparalleled speed, flexibility, and quality. All editors revolve around a central data dictionary; the heart of the system.

FreeFlow by Iconix

Product Information:

Version Number: 4.02
Date of Last Release: ---
Date of First Release: ---
Number Sold: ---
Single User Price: \$995

Contact Information:

Point of Contact:

Name: Pam Johnson
Address: 2800 28th St., Suite 320
Santa Monica, CA 90405
Phone Number: 310-458-0092
Fax Number: 310-396-3454
E-mail Address: apple1.nk.iconix

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	✓ Hard Real-time:
✓ MIS	✓ Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

FreeFlow provides support for DeMarco Structured Analysis with real-time extensions (Data and Control Flow Diagrams, Data Dictionary, Minispecs, Consistency Checking) and several object-oriented methods.

G++ by SYCO (U.S. Distributor: MLSI)

Product Information:

Version Number: 4.0
 Date of Last Release: February 1993
 Date of First Release: 1990
 Number Sold: 50
 Single User Price: \$15,000

Contact Information:

Point of Contact:

Name: M. Lipton
 Address: 64 Hill Street
 Lexington, MA
 Phone Number: 617-862-2709
 Fax Number: ---
 E-mail Address: michael.lipton@channel.com

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	✓ Simulation	Process Technologies
✓ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
MIS	Real-time	✓ Other: CIM - integration

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM RS/6000, Sun SPARC, DEC (UNIX)

Description/Purpose:

G++ is an object-oriented design and prototyping environment based on C++. It includes three libraries of reusable class modules (70 classes): basic data structures, a graphic library of X Windows interactive objectives, and a multitasking and discrete events library. Includes a multiwindow graphic editor and a simulator. G++ can be used to model and simulate manufacturing processes, hierarchical control structures, automated process control systems and other dynamic systems. Employs a combination of hierarchical object-oriented design, discrete event simulation and petri net representations.

Goldrun by Computer Systems Advisers

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: ---
Single User Price: ---

Contact Information:

Point of Contact:

Name: Anthony DeTaranto
Address: 50 Tice Boulevard
Woodcliff Lake, NJ 07675
Phone Number: 1-800-537-4262
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
Maintenance	Simulation	✓ Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS), DEC VAX, HP, UNISYS (UNIX), IBM AS/400 (OS/400)

Description/Purpose:

Goldrun provides tools for detailed design, full-function prototyping, development, and maintenance of production SQL applications. Goldrun captures all processing requirements at the specification level to make applications independent of the production environment. Goldrun provides support for SQL/400 on the AS/400 and has a bridge to the Upper CASE analysis and design tool, Silverrun; one of the vendor's other tools.

GRAMMI by EVB Software Engineering Company

Product Information:

Version Number: 1.0
 Date of Last Release: ---
 Date of First Release: January 1992
 Number Sold: ---
 Single User Price: \$2,950 - \$62,950

Contact Information:

Point of Contact:

Name: Jennifer Lott
 Address: 5303 Spectrum Drive
 Frederick, MD 21701
 Phone Number: 301-695-6960
 Fax Number: 301-695-7734
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured ✓ Object-Oriented Behavior-Oriented

Configurations:

Workstations (UNIX)

Description/Purpose:

GRAMMI (Generated Reusable Ada Man Machine Interface) is an interactive interface construction tool for use with Ada programs. Written in Ada, GRAMMI uses the MIT X Window System to produce MMI software written in Ada. Employing a point and click construction style, GRAMMI can be used to prototype the MMI for an application and generate the implementing Ada source code for incorporation into the deliverable system.

IDEF/Leverage by D. Appleton Company, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 55
 Single User Price: \$10,000 - \$65,000

Contact Information:

Point of Contact:

Name: James George
 Address: 225 S. Sepulveda Blvd.
 Suite 300
 Manhattan Beach, CA 90266
 Phone Number: 310-374-3939
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	√ Documentation	√ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	√ Technical (Engineering)	Hard Real-time:
√ MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

DEC VAX, IBM 43xx, IBM 303/4x, IBM 308x, IBM 3090, IBM 360/370 (MVS, VMS, TSO, MVS/XA)

Description/Purpose:

IDEF/Leverage uses the processing power of the host computer to integrate, analyze, normalize, and report on the standard IDEF models that are created by the vendor's methodology for designing organizational databases and managing organization-wide data resources. IDEF assists in analyzing an organization's business rules and data usage and transforms the organization's DBMS model into SQL statements as a start towards system implementation. It supports business reengineering and process improvement, data model integration, and conceptual schema management.

IE:Advantage by Information Engineering Systems Corp.

Product Information: Version Number: 6.0 Date of Last Release: January 1993 Date of First Release: 1987 Number Sold: 200 Single User Price: ---	Contact Information: Point of Contact: Name: Irv Sentz Address: 201 N. Union St., 5th Floor Alexandria, VA 22314 Phone Number: 703-739-2242 Fax Number: 703-739-0074 E-mail Address: ---
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Lifecycle Phases and Activities:		
✓ Analysis ✓ Design Coding ✓ Testing ✓ Maintenance Environment Other: Strategic Business Planning, Data Modeling, Process Modeling	✓ Configuration Management ✓ Project Management ✓ Requirements Management ✓ Documentation Simulation ✓ Quality Assurance	✓ Metrics ✓ Reuse Ada Compilers ✓ Databases ✓ Process Technologies ✓ Reengineering

Intended Customers:		
All ✓ MIS	Technical (Engineering) Real-time	Hard Real-time: Other:

Primary Methodology:		
✓ Structured	✓ Object-Oriented	Behavior-Oriented

Configurations:
IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows)

Description/Purpose:
IE:Advantage is an integrated, full lifecycle Information Engineering CASE tool. The tool runs on Windows and is available in both single and multiuser versions.

IEW/Workstations by Knowledgeware Federal Systems

Product Information:	Contact Information:
Version Number: ---	Point of Contact:
Date of Last Release: ---	Name: Al Fox
Date of First Release: ---	Address: 3340 Peachtree Road, NE
Number Sold: 70,000	Atlanta, GA 30026
Single User Price: \$16,125	Phone Number: 703-506-0800
	Fax Number: 703-506-0154
	E-mail Address: ---

Lifecycle Phases and Activities:		
√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
√ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:		
√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:		
√ Structured	Object-Oriented	Behavior-Oriented

Configurations:
IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:
Information Engineering Workbench/Workstations (IEW) provides a fully integrated (but modular) PC platform for application development from planning through analysis and design to construction. The major products, called workstations, that make up the IEW platform include: IEW/Analysis, IEW/ Design, IEW/Planning, EW/Construction.

Information Engineering (IE) by Ipsys Software>

Product Information:

Version Number: 1.2.2
 Date of Last Release: December 1992
 Date of First Release: ---
 Number Sold: ---
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Jonathan Thompson
 Address: 28 Green Street
 Newbury, MA 01951
 Phone Number: 508-463-0006
 Fax Number: 508-462-9198
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	Metrics
✓ Design	✓ Project Management	✓ Reuse
✓ Coding	✓ Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	✓ Databases
✓ Maintenance	Simulation	Process Technologies
Environment	✓ Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM RS/6000 (AIX), Sun (Sun OS, Solaris, Ultrix), HP (UX)

Description/Purpose:

Information Engineering toolset supports the James Martin Information Engineering method to the point where it currently generates 80 percent of application code including database schemas, etc. It is used for client/server-based systems, OLTP systems and for building resalable systems. It produces COBOL, C, C++, Ada, various 4GLs, Informix, Oracle, Sybase, Ingress, and is PCTE compliant.

Information Engineering Facility (IEF) by Texas Instruments

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 600
Single User Price: \$9,400 - \$23,800

Contact Information:

Point of Contact:

Name: Marketing Department
Address: 6500 Chase Oaks Boulevard
Plano, TX 75023
Phone Number: 214-575-4553
Fax Number: 214-575-3201
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	✓ Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, DEC, HP Tandem, IBM 43xx, IBM 303/4x, IBM 308x, IBM 3090
(MVS, VM, VMS, UNIX, TSO, CMS, CICS, PC/MS DOS, MVS/XA, OS/2)

Description/Purpose:

Information Engineering Facility (IEF) is a methodology-driven, integrated set of CASE tools (I-CASE) that automates the systems development lifecycle from strategic planning through analysis, design, code, and database generation, with an overall model providing the integrating framework.

Integrated System Engineering Toolset by LBMS, Inc.

Product Information:

Version Number: 4.0
 Date of Last Release: 1992
 Date of First Release: 1979
 Number Sold: 15,000
 Single User Price: \$7,500

Contact Information:

Point of Contact:

Name: Peter Combe
 Address: 1800 West Loop South
 Suite 1800
 Houston, TX 77027
 Phone Number: 1-800-231-7515
 Fax Number: 713-623-4995
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	√ Technical (Engineering)	Hard Real-time:
√ MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2, Microsoft Windows)

Description/Purpose:

Integrated Systems Engineering Toolset (ISET) is LBMS's I-CASE offering and consists of LBMS Systems Engineer, LBMS Systems Engineer/Open, LBMS Workplace, LBMS Applications Engineer, and LBMS Information Manager. Systems Engineer provides design and analysis capabilities as well as a strategic-analytic framework for making decisions on what system projects to undertake and in what order. It specifically addresses such business considerations as organizational goals and objectives and the relative importance of the various functions and activities in achieving those goals and objectives.

ISE Eiffel 3 by Interactive Software Engineering, Inc.

Product Information:

Version Number: 3.0
Date of Last Release: March 1992
Date of First Release: August 1988
Number Sold: ---
Single User Price: \$995 - \$1,995

Contact Information:

Point of Contact:

Name: Darcy Harrison
Address: 270 Storke Road, Suite 7
Goleta, CA 93117
Phone Number: 805-685-1006
Fax Number: 805-685-6869
E-mail Address: darcyh@eiffel.com

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	✓ Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
✓ Maintenance	✓ Simulation	Process Technologies
✓ Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	✓ Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

SUNSPARC, Sun 3, Sun 4, IBM RS/6000, MIPS, Apollo DN, 386/486 (ESIX, AT&T), Silicon Graphics, Sony, VAX (ULTRIX, VMS), DECstation (ULTRIX), HP (UX), 386/486 SCO-ODT, NeXT, Apple A/UX and other 88 open platforms.

Description/Purpose:

ISE Eiffel 3 is an object-oriented programming environment designed for large industrial projects. ISE Eiffel 3 provides an integrated solution for software developers through pure object-oriented methods. ISE Eiffel 3 consists of efficient tools and reusable libraries: EiffelBench, EiffelBase, EiffelVision, EiffelBuild, EiffelStore, and EiffelCase.

Keyone by LPS (Language and Programming Sys

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 300
 Single User Price: \$685 - \$21,400

Contact Information:

Point of Contact:
 Name: Giovanna Petrone
 Address: Via Napone 25
 Torino, Italy 10124
 Phone Number: +39-11-831830
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, Sun Workstation, Apollo Workstation, NEC Workstation, DEC VAX, HP (PC/MS DOS, UNIX, ULTRIX, VMS)

Description/Purpose:

Keyone is a CASE toolset built using hypertext technology and designed to support the design, programming, and documentation phases of software projects using Ada, C, C++, Fortran, COBOL, Pascal, HOOD ODS, PL/M, Jovial, VDM, and SQL extensions to standard languages.

LANSA by LANSA USA Inc.

Product Information:

Version Number: BETA 1.0
Date of Last Release: December 1992
Date of First Release: December 1992
Number Sold: - --
Single User Price: ---

Contact Information:

Point of Contact:

Name: Marketing Department
Address: 460 Quail Ridge Drive
Westmont, IL 60559
Phone Number: 708-323-7779
Fax Number: 708-789-2176
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	✓ Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

IBM System/38 (CPF), IBM AS/400 (OS/400)

Description/Purpose:

LANSA, developed specifically for users of the IBM AS/400 and System/38, provides integrated environments for complete system design, implementation, and maintenance. The environments consist of an active data dictionary, an integrated data dictionary modeling facility, a procedural Rapid Development and Maintenance Language (RDML) and templates for automatic generation of RDML programs, an automatic screen painter, a report writer, a system security function, and a multiple CPU/user environment.

LINC II by Unisys Corporation

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: April 1991
 Number Sold: 3,500
 Single User Price: \$9,994 - \$322,575

Contact Information:

Point of Contact:

Name: Christie Wood
 Address: P.O. Box 500, MS: B260
 Blue Bell, PA 19424-0001
 Phone Number: 215-993-6135
 Fax Number: 215-993-7066
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
✓ Other: Design Optimization, Function Point Analysis		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

Structured (none)	Object-Oriented	Behavior-Oriented
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Configurations:

Unisys (UNIX, Microsoft Windows)

Description/Purpose:

LINC II (LINC) is an industrial-strength, mainframe-based application generator. It generates enterprise-wide applications, typically high-volume, on-line transaction, database-oriented applications. Applications developed by LINC can be run across any Unisys mainframe platform and can be ported to platforms supported by UNIX. There are two versions of the system – a development version and a run-time version (development must be on a Unisys platform). LINC is an acronym for Logic and Information Network Compiler.

MacAnalyst/Expert by Excel Software

Product Information:

Version Number: 4.1
 Date of Last Release: 1994
 Date of First Release: 1987
 Number Sold: 2,000
 Single User Price: \$995

Contact Information:

Point of Contact:

Name: Harold Halbleib
 Address: P.O. Box 1414
 Marshalltown, IA 50158
 Phone Number: 515-752-5359
 Fax Number: 515-752-2435
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

MacAnalyst is a tool for professional system analysts and software developers that automates industry standard techniques. Provides graphical editors for data and control flow diagrams and information models with hierarchical leveling; provides a text editor with customizable templates for process specifications; forms-based data dictionary entry, including composite data types. Automatic checking for diagram errors, balancing errors and data inconsistency. Generates tree diagrams of data structures from data dictionary contents. Process objects can be related to text documents that contain minispecs, annotation, or source code. Includes a requirements database to support tracking between requirements.

STSC RAD Product Sheet Version 2.0b

MacBubbles by Starsys, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 300
 Single User Price: \$400 - \$780

Contact Information:

Point of Contact:

Name: Richard Cohen
 Address: 11113 Norlee Drive
 Silver Spring, MD 20902
 Phone Number: 301-946-0522
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

MacBubbles is an integrated multi-window CASE tool designed to provide support for structured analysis and design on the Apple Macintosh. The product creates data flow diagrams, entity relationship diagrams, state transition diagrams, and program structure charts using the full capabilities of the Apple LaserWriter. Macbubbles uses PostScript to provide curved data flows whose titles follow the shape of the data flow for easy identification. A data dictionary and mini-spec editor are included in the product. Real-time data flow diagram symbols of Boeing/Hatley, Ward/Mellor, and ESML are all supported.

MacDesigner/Expert by Excel Software

Product Information:

Version Number: 4.1
Date of Last Release: 1994
Date of First Release: 1986
Number Sold: 2,000
Single User Price: \$995

Contact Information:

Point of Contact:

Name: Harold Halbleib
Address: P.O. Box 1414
Marshalltown, IA 50158
Phone Number: 515-752-5359
Fax Number: 515-752-2435
E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

MacDesigner is a software design tool to automate the structured design process or document existing software systems. Provides a graphical editor for structure charts with hierarchical leveling. Also supports inheritance diagrams representing object class structure and stub connections that retain linkages for cross-reference listings. Also provides a text editor with customizable templates for module interface and internal specifications. Produces data dictionary and verification reports; generates tree diagrams of data and calling structures from data dictionary contents. Forms-based data dictionary entry, including composite data types. Automatic checking for diagram errors, balancing errors and data inconsistency. Process objects can be related to text documents that containing annotation or source code.

STSC RAD Product Sheet Version 2.0b

Maestro II by Softlab Inc.

Product Information:

Version Number: 2.0
Date of Last Release: July 1992
Date of First Release: October 1989
Number Sold: 5,000
Single User Price: \$10,500

Contact Information:

Point of Contact:

Name: Marketing Department
Address: 188 The Embarcadero #750
San Francisco, CA 94105
Phone Number: 415-957-9175
Fax Number: 415-957-9879
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	✓ Metrics
✓ Design	✓ Project Management	✓ Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	✓ Databases
✓ Maintenance	Simulation	✓ Process Technologies
✓ Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, IBM RS/6000, DEC VAX, HP (PC/MS DOS, OS/2, UNIX, ULTRIX)

Description/Purpose:

Maestro II is a dedicated system development environment using PC workstations and UNIX servers to develop software for any target computer environment.

MAGEC Rapid Application Development System by Magec Software

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: --- Number Sold: 1,600 Single User Price: \$500 - \$20,000	Contact Information: Point of Contact: Name: Vic Lee Address: 4054 Infomart 1950 Stemmons Freeway Dallas, TX 75207 Phone Number: 1-800-336-2432 Fax Number: --- E-mail Address: ---
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Lifecycle Phases and Activities:		
✓ Analysis ✓ Design ✓ Coding ✓ Testing ✓ Maintenance Environment Other:	Configuration Management Project Management Requirements Management ✓ Documentation Simulation Quality Assurance	Metrics Reuse Ada Compilers Databases Process Technologies Reengineering

Intended Customers:		
✓ All MIS	Technical (Engineering) Real-time	Hard Real-time: Other:

Primary Methodology:		
✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented

Configurations: IBM XT/AT/PS2, IBM Workstation IBM 43xx, IBM 308x, IBM 3090, IBM 360/370, Amdahl, NAS (PC/MS DOS, OS/2, Microsoft Windows, DOS (Mainframe), MVS, VM VSE, CMS, CICS, MVS/XA)

Description/Purpose: MAGEC (Mask Application Generation Environment) Rapid Application Development System is a full lifecycle system development and application management environment, integrated via an active centralized dictionary (repository). It utilizes a "self-actualizing" prototyping methodology in concert with the dictionary to generate complete COBOL applications, including screens, programs, reports, documentation, security, menus, help keys, and parameter files. The development and maintenance of both batch and on-line systems is supported by the development approach. MAGEC supports 3270s, generates customizable COBOL, and has mainframe and PC versions.
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MATE by Advanced Development Methods**Product Information:**

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 14
 Single User Price: \$1,000 - \$4,500

Contact Information:**Point of Contact:**

Name: Ken Schwaber
 Address: 49 Solomon Pierce Rd.
 Lexington, KY 02173
 Phone Number: 617-861-7848
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	√ Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2, Microsoft Windows)

Description/Purpose:

MATE (Methods and Tool Expert) is a PC-based methodology support tool that provides guidance in building systems using CASE tools. It runs on line on PCs under either Windows 3.0 or OS/2 standard or extended edition. MATE is SAA certified by IBM and is completely graphic. The product uses hypertext techniques to store and present information. MATE describes how to build systems using either Information Engineering or Structured Methods, and describes in detail how to use either set of methods on Excelerator from Intersolv or IEW/ADW from KnowledgeWare. Furthermore, the product can be customized to reflect the specific methods and techniques used in any organization.

MATRIX X, SystemBuild, & Autocode by Integrated Systems, Inc.

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: --- Number Sold: --- Single User Price: \$2,495 - \$75,000	Contact Information: Point of Contact: Name: Marketing Group Address: 3260 Jay Street Santa Clara, CA 95054 Phone Number: 408-980-1500 Fax Number: --- E-mail Address: ---
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Lifecycle Phases and Activities:		
<input checked="" type="checkbox"/> Analysis <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Coding Testing Maintenance Environment Other:	Configuration Management Project Management Requirements Management Documentation <input checked="" type="checkbox"/> Simulation Quality Assurance	Metrics Reuse Ada Compilers Databases Process Technologies Reengineering

Intended Customers:		
All MIS	<input checked="" type="checkbox"/> Technical (Engineering) <input checked="" type="checkbox"/> Real-time	<input checked="" type="checkbox"/> Hard Real-time: Other:

Primary Methodology:		
<input checked="" type="checkbox"/> Structured	<input checked="" type="checkbox"/> Object-Oriented	<input checked="" type="checkbox"/> Behavior-Oriented

Configurations:
Sun Workstation, DEC Workstation, HP Workstation, IBM RS/6000, DEC VAX (VMS, UNIX, OS/2)

Description/Purpose:
<p>The Integrated Systems, Inc. product family consists of the MATRIX X, SystemBuild, and Autocode products. Each of these products consists of individual modules that may be mixed and matched to suit the developer's needs. The modules and products can be integrated seamlessly. Collectively, MATRIX X, SystemBuild, and Autocode provide a complete set of tools to develop complex real-time software applications. Specifically, these products provide tools that support systems analysis and control design, linear and nonlinear simulation, block diagram system modeling, and automatic real-time code generation and implementation.</p>

Medley w/Rooms by Venue

Product Information:

Version Number: 2.0
 Date of Last Release: June 1991
 Date of First Release: September 1988
 Number Sold: 150
 Single User Price: \$795 - \$7,995

Contact Information:

Point of Contact:

Name: John Sybalsky, Chris West
 Address: 1549 Industrial Road
 San Carlos, CA 94070
 Phone Number: 415-508-9672
 Fax Number: 415-508-9770
 E-mail Address: sales.mv@envos.xerox.com

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, Sun, HP Series 700, DECstation, DECAAlpha, Silicon Graphics, IBM RS/6000, MIPS RISCStation (PC/MS DOS, UNIX)

Description/Purpose:

Medley is a complete Lisp development environment. It supports Common Lisp and Interlisp D. Medley comes with an interpreter, compiler, debugger, window system, and two libraries totaling more than 500 ready-to-use packages. Rooms is a window-organizing tool that comes bundled with Medley. It allows the user to group windows by task thus reducing screen clutter.

Metavision by Applied Axiomatics

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 55
 Single User Price: \$12,500 - \$32,500

Contact Information:

Point of Contact:

Name: Ron Cowley
 Address: The Empire State Bldg., Suite 7901
 350 Fifth Avenue
 New York, NY 10118
 Phone Number: 212-643-1315
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

Metavision is a suite of products – Cybernetic Business Modeling, Software Engineering, and Software Generation – that builds a detailed, layered graphical model of a business (or organizational) operation and then uses the model to generate applications software for that operation. A key component of Metavision is its Connected Development Methodology, which is built into the Metavision products. The Methodology, which is a superset of the Yourdon/DeMarco methodology, provides a step-by-step approach to lead developers through the system development phase.

Methodmanager by Manager Software Products, Inc.**Product Information:**

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 180
 Single User Price: \$50,000 - \$350,000

Contact Information:**Point of Contact:**

Name: Lesley Tyler
 Address: 131 Hartwell Avenue
 Lexington, MA 02173-3126
 Phone Number: 617-863-5800
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

IBM XT/AT/PS2, IBM 43xx, IBM 303/4x, IBM 308x, IBM 3090, Amdahl, NAS
 (PC/MS DOS, MVS, VW, TSO, CMS)

Description/Purpose:

Methodmanager is a repository-driven Applications Development Environment (ADE) for enabling the concepts of IBM's AD/Cycle or other applications development strategies. This open architecture ADE product enables developers to use the CASE tools and methods of their choice. Within the method-manager environment the selected tools and methodology are integrated, automated, and supported to create a repository-based solution. The information engineering process is driven through the steps of the selected methodology, utilizing each CASE tool as required. The vendor's intent in providing Methodmanager is to enable organizations to implement the AD/Cycle concept now in a fully functional ADE while IBM continues to develop AD/Cycle and its own repository.

Micro Focus COBOL Workbench by Micro Focus

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 50,000
Single User Price: \$2,500

Contact Information:

Point of Contact:

Name: Marketing Group
Address: 2465 East Bayshore Rd.
Suite 400
Palo Alto, CA 94303
Phone Number: 415-856-4161
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

Structured	Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, Data General, (PC/MS DOS, OS/2, Microsoft Windows, UNIX)

Description/Purpose:

The Micro Focus COBOL Workbench is a suite of COBOL development tools directed at facilitating the development, debugging, and testing of business applications for operation in a variety of target environments including MVS, VM DOS/VS(E), MS-DOS, OS/2, Microsoft Windows, and all major UNIX environments. The product provides EBCDIC data support, file transfer support, and mainframe file conversion support.

MicroSTEP by SYSCORP International

Product Information:

Version Number: 1.61
 Date of Last Release: January 1992
 Date of First Release: 1987
 Number Sold: 2,000
 Single User Price: \$1,895

Contact Information:

Point of Contact:

Name: Robert F. Albach
 Address: 9430 Research Blvd.
 Bldg IV, #300
 Austin, TX 78759
 Phone Number: 512-338-5800
 Fax Number: 512-338-5810
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	✓ Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

MicroSTEP is a PC-hosted visual design environment based on CASE paradigms. The tool creates stand-alone or client-server EXEs from graphical flow diagrams. The design is created using icons, described to their atomic level via graphical descriptions, and checked for completeness and correctness. If the check is successful, then C code is generated, compiled, and a runtime free EXE is produced as well as system documentation. The design, documentation, and EXE are always in synch. All maintenance is performed on the design and not the C code.

Model-C by Systems Control Technology, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: 1982
 Number Sold: 100
 Single User Price: \$13,995

Contact Information:

Point of Contact:

Name: Carol Michaels
 Address: 2300 Geng Road
 P.O. Box 10180
 Palo Alto, CA 94303-0888
 Phone Number: 415-494-2233
 Fax Number: 415-496-6595
 E-mail Address: cae_sales@sct.com

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

VAX/VMS, UNIX, Aegis, PC/DOS, ULTRIX, Sun/OS, Apollo, Convex

Description/Purpose:

Model-C is an interactive software package for the modeling and simulation of nonlinear dynamic systems. A multiwindow graphical user interface incorporates block diagrams and systems that can be "drawn" using a mouse. The package is designed around Ctrl-C. Model-C's equilibration and linearization capabilities combine well with Ctrl-C to simulate a system model.

ModelPro by D. Appleton Company, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 150
 Single User Price: \$1,195

Contact Information:

Point of Contact:

Name: James George
 Address: 225 S. Sepulveda Blvd.
 Suite 300
 Manhattan Beach, CA 90266
 Phone Number: 310-374-3935
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

ModelPro is a Microsoft Windows-based data (IDEF1X) modeling tool that runs on IBM PCs and compatibles, and provides direct support to the vendor's IDEF/Leverage package. ModelPro enables the developer to produce enhanced entity-relationship 'ER' models at a PC and provides two-way communication with IDEF/Leverage. Models created on the PC can be uploaded to the host for detailed analysis, normalization, and integration into larger, enterprise-wide models, and models on the host can be downloaded to the PC for revision.

Natural Engineering Series by Software AG of North America, Inc.

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 5,000
Single User Price: \$16,000 - \$196,000

Contact Information:

Point of Contact:

Name: Greg Hagen
Address: 11190 Sunrise Valley Drive
Reston, VA 22091
Phone Number: ---
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, Apple Macintosh, DEC, DEC VAX, IBM 43xx, IBM 303/4x, IBM 308x, IBM 3090, IBM 360/370, Amdahl, NAS (DOS (mainframe), MVS, VM, VMS, VSE, TSO, CMS, CICS, PC/MS DOS, MVS/XA)

Description/Purpose:

The Natural Engineering Series (NAS) is a suite of integrated CASE products that brings automated support to all phases of the system development lifecycle.

Object Plus by Protosoft, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Carlos Carvajal
 Address: 17629 El Camino Real
 Suite 202
 Houston, TX 77058
 Phone Number: 713-480-3233
 Fax Number: 713-480-6606
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
√ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	√ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows)

Description/Purpose:

Object Plus is an object-oriented designer, data modeler, and C, C++, Ada, and Turbo Pascal code generator. The tool utilizes a Windows environment and is based upon Coad and Yourdon's object-oriented analysis method. It supports object-oriented analysis (OOA), object-oriented design and programming (OOD), and the Lekkos methodology, which is an extension of OOA. The product provides a variety of facilities that support requirements definition, preliminary system and detailed design, object-oriented code generation, reverse engineering, and system documentation.

Objectmaker by Mark V Systems

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 1,500
Single User Price: \$3,000 - \$8,000

Contact Information:

Point of Contact:

Name: Mo Bjornestad
Address: 16400 Ventura Blvd.
Suite 303
Encino, CA 91436
Phone Number: 818-995-7671
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, IBM Workstations, Sun Workstations, Apollo Workstations, DEC Workstations, HP Workstations, IBM RS/6000, Data General (PC/MS DOS, VMS, UNIX, ULTRIX, OS/2, Microsoft Windows)

Description/Purpose:

Objectmaker is an advanced analysis and design tool. In its most popular configuration, Objectmaker CASE Tool, it incorporates either an Ada or C/C++ language module for code generation and reverse engineering. The tool provides life-cycle support for object-oriented and traditional software development methods.

ObjectModeler by Iconix

Product Information:

Version Number: 1.2
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: \$995

Contact Information:

Point of Contact:

Name: Pam Johnson
 Address: 2800 28th St., Suite 320
 Santa Monica, CA 90405
 Phone Number: 310-458-0092
 Fax Number: 310-396-3454
 E-mail Address: applelink:iconix

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

ObjectModeler supports the object-oriented methods of Rumbaugh, Coad/Yourdon, and Booch with four graphical editors, includes Data Dictionary, and provides Language Sensitive Editors for OOP including C++.

Objectory by Objective Systems

Product Information:

Version Number: 3.3
Date of Last Release: 15 December 1992
Date of First Release: 1 June 1988
Number Sold: 175
Single User Price: \$4,000 - \$10,000

Contact Information:

Point of Contact:

Name: Fredrik Lindstrom
Address: Torshamnsgatan 39. Box
1128 S-164 22 KISTA
Sweden
Phone Number: +46-8703-4530
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	✓ Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

IBM XT/AT/PS2 (PC/MS DOS), UNIX Platforms, Apple Macintosh

Description/Purpose:

Objectory is a development process that is used in large system development. It consists of a process description and support environment. The support environment works on all major UNIX platforms, PCs and Apple Macintosh.

Oracle CASE by Oracle Corporation

Product Information:	Contact Information:
Version Number: ---	Point of Contact:
Date of Last Release: ---	Name: Renee Taylor
Date of First Release: ---	Address: 500 Oracle Parkway, Suite 4
Number Sold: 5,000	Redwood Shores, CA 94065
Single User Price: \$3,000 - \$150,000	Phone Number: 1-800-345-3267
	Fax Number: ---
	E-mail Address: ---

Lifecycle Phases and Activities:		
✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:		
All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:		
✓ Structured	Object-Oriented	Behavior-Oriented

Configurations:
IBM XT/AT/PS2, IBM Workstation, Sun Workstation, Apollo Workstation, DEC Workstation, HP Workstation, Silicon Graphics, IBM RS/6000, DEC VAX, DEC, Data General, HP, IBM 43xx, IBM 303/4x, IBM 308x, IBM 3090, Data General, Amdahl, NCR, CDC (DOS (Mainframe), MVS, VM, VMS, UNIX, TSO, CMS, PC/MS DOS, MVS/XA, OS/2)

Description/Purpose:
Oracle CASE Architecture (OCA) is the label given in this profile to the family of products Oracle provides to support Computer-Aided Systems Engineering. The family consists of CASE*Method, CASE*Dictionary, CASE*Designer, and CASE*Generator for SQL*Forms. CASE*Method is a documented methodology that covers the entire system development lifecycle. CASE*Dictionary is a portable, multi-user repository that serves as the focal point for all development activity. CASE*Designer provides a set of tools that are directed primarily at the analysis and design phases of systems development. CASE*Generator for SQL*Forms automatically generates working applications from design specifications contained in DATA*Dictionary.

STSC RAD Product Sheet Version 2.0b

PACE by Wang Laboratories, Inc.

Product Information:

Version Number: 1.0
Date of Last Release: February 1993
Date of First Release: February 1993
Number Sold: ---
Single User Price: \$395 - \$995

Contact Information:

Point of Contact:

Name: Judy Cole
Address: 1 Industrial Avenue
M/S 014-89A
Lowell, MA 01851
Phone Number: 508-967-2199
Fax Number: 508-967-5110
E-mail Address: Judith.M.Judy.J.Cole@office.
wang.com

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows)

Description/Purpose:

PACE is a family of tools used on Windows for MIS purposes. The family includes PACE Application Builder for Windows, PACE Dictionary Builder for Windows, PACE Query Builder for Windows, and PACE Report Builder for Windows. Information on each tool provided by the STSC on request.

STSC RAD Product Sheet Version 2.0b

Paradigm Plus by Protsoft, Inc.

Product Information:

Version Number: 1.02
 Date of Last Release: ---
 Date of First Release: May 1992
 Number Sold: 100
 Single User Price: \$5,000 - \$8,000

Contact Information:

Point of Contact:

Name: Carlos Carvajal
 Address: 17629 El Camino Real
 Suite 202
 Houston, TX 77058
 Phone Number: 713-480-3233
 Fax Number: 713-480-6606
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	✓ Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows), Sun SPARC

Description/Purpose:

Paradigm Plus is an object-oriented CASE tool that supports the most popular object-oriented methods. It's configurable and customizable, a meta-CASE tool. Paradigm Plus scales to large systems, facilitates reuse, provides an open architecture, and is a high-performance tool.

Performance Architek by Windtunnel Software

Product Information:

Version Number: 1.2.2
Date of Last Release: February 1992
Date of First Release: December 1990
Number Sold: 20
Single User Price: \$25,000 - \$42,000

Contact Information:

Point of Contact:

Name: Gene Scray
Address: 730 N. LaSalle Street
Suite 1166
Chicago, IL 60610
Phone Number: 312-464-1400
Fax Number: 312-464-0443
E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	✓ Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

Performance Architek is designed to help system developers test the potential performance of software designs before the designs are coded. It can be used to predict how the software will perform under different operating platforms and under different business conditions, and provides statistical data that is useful for capacity planning. While the product can be applied to software designs created by the developer, it can also be applied to designs that have been imported from other vendor tools such as those available from Index Technology, Knowledgeware, Synon, and Bachman.

POSE by Computer Systems Advisers

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 3500
 Single User Price: \$1,195 - \$2,995

Contact Information:

Point of Contact:

Name: Anthony C. DeTaranto
 Address: 50 Tice Boulevard
 Woodcliff Lake, NJ 07675
 Phone Number: 1-800-537-4262
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

POSE (Picture-Oriented Software Engineering) is a modular set of integrated, PC-based systems analysis and design tools that addresses the planning, design, and analysis phases of application software development. It is completely directed to the PC environment and provides bidirectional data transfer to and from back-end CASE products such as IBM's CSP and Knowledgeware's Information Engineering Workbench (IEW) and Application Development Workbench (ADW) central repository. The product also provides reverse engineering capabilities, which allow users to import existing database schema and file structures to popular the POSE data dictionary.

PowerCASE by Cognos

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: \$16,500

Contact Information:

Point of Contact:

Name: Jay Fiore
 Address: 67 S. Bedford Street
 Burlington, MA 01803
 Phone Number: 617-229-6600
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (OS/2), DEC VAX (VMS)

Description/Purpose:

PowerCASE is the design and analysis component of the vendor's Powerhouse Application Development Environment. That environment includes the following products in addition to PowerCASE - Powerhouse ("forms" painting and code documentation); Architect (which supports maintenance, user documentation and testing); Inquizative (an end-user report painter and writer); Powerplay (for end-user management reporting); and Starbase (an ANSI-standard SQL-based relational database). PowerCASE is tightly linked to Powerhouse 4GL as well as to products in the set described above.

PowerPDL by Iconix

Product Information:

Version Number: 2.12
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: \$995

Contact Information:

Point of Contact:

Name: Pam Johnson
 Address: 2800 28th St., Suite 320
 Santa Monica, CA 90405
 Phone Number: 310-458-0092
 Fax Number: 310-396-3454
 E-mail Address: applelink:iconix

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

PowerPDL supports detailed algorithm design using pseudocode. The built-in Strip utility allows automatic design generation of documentation from the comments in the code during software maintenance.

PRIDE Information Factory by M. Bryce & Associates, Inc.

Product Information:

Version Number: 1.0.0
Date of Last Release: January 1993
Date of First Release: ---
Number Sold: ---
Single User Price: \$25,000

Contact Information:

Point of Contact:

Name: Tim Bryce
Address: 777 Alderman Road
Palm Harbor, FL 34683
Phone Number: 813-786-4567
Fax Number: 813-786-4765
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	✓ Project Management	✓ Reuse
✓ Coding	✓ Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	✓ Process Technologies
Environment	✓ Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (OS/2 version 2.0 or higher)

Description/Purpose:

Integrated Approach for Information Resource Management (IRM). Includes embedded methodologies for enterprise engineering, information systems engineering, and database engineering. An OS/2-based repository is included to store and reuse information resources. A project management system is also included for planning, estimating, scheduling, reporting, and controlling projects. SAA/CUA standard product.

Prodeveloper by Holland Systems Corporation

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 120
 Single User Price: \$5,000 - \$8,500

Contact Information:

Point of Contact:

Name: Suzanne C. Morrison
 Address: 305 E. Eisenhower PW
 Suite 300
 Ann Arbor, MI 48108-1632
 Phone Number: 313-995-9595
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Description/Purpose:

Prodeveloper supports the analysis, design, and construction of systems and databases. It features a structured approach to requirements definition and construction of application systems and is driven by a proprietary methodology for system development. Specifications developed during the requirements phase can be used to generate application and relational database code in the construction phase.

ProKappa by IntelliCorp, Inc.

Product Information:

Version Number: 2.1
Date of Last Release: November 1991
Date of First Release: September 1990
Number Sold: 2,500
Single User Price: \$19,950

Contact Information:

Point of Contact:

Name: Rhiannon Williams
Address: 1975 El Camino Real West
Mountain View, CA 94040-
2216
Phone Number: 415-965-5612
Fax Number: 415-965-5647
E-mail Address: RWilliams@Intellicorp.com

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	✓ Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Sun 4/Sparc (Sun OS 4.1.3), IBM RS/6000 (IBM AIX 3.2), HP9000 (HP UX 8.0)

Description/Purpose:

IntelliCorp's Kappa family of products provides a visual, object-oriented environment for Rapid Design, Development and Deployment of distributed applications on UNIX and PCs. The Kappa family includes links to CASE tools, transaction processing monitors, relational databases, and legacy systems. Included within the product set are a powerful object management system, flexible languages and rule-based systems, graphical user interface development environment, and graphical debuggers.

Prokit* Workbench by McDonnell Douglas Information Systems Company

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 2,800
 Single User Price: \$7,200 - \$9,200

Contact Information:

Point of Contact:

Name: Tom Schwab
 Address: P.O. Box 516
 Mail Code 2811140
 St. Louis, MO 63166-0516
 Phone Number: 1-800-225-7760
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

Prokit* Workbench is a CASE tool that supports the application of structured techniques to the system development lifecycle. It supports the strategic planning, analysis, design, and development/maintenance phases of systems development in a real-time data-sharing, multiuser LAN environment. The tool complements and is part of a complete McDonnell Douglas lifecycle solution, which includes the STRADIS system development methodology and PRO-IV, an application generation environment that produces applications portable to more than 30 hardware/software platforms, including IBM, DEC, and Unix platforms. Prokit* Workbench also interfaces to other application generation environments including IBM's CSP/AD and Panasophic's Telon.

Promod CASE Tools by Meridian Software Systems

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 5,000
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Jim Smith
 Address: 10 Pasteur Street
 Irvine, CA 92718
 Phone Number: 714-727-0700
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	✓ Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Sun Workstation, HP Workstation, DEC VAX, HP (VMS, UNIX, ULTRIX)

Description/Purpose:

Promod CASE Tools is a family of tools that addresses requirements analysis, hierarchical modular design, program logic design, and source code generation. Promod/SART (Structured Analysis for Real Time) supports structured analysis (Yourdon/DeMarco) with data flow diagrams, data dictionary and process specifications, and real-time extensions (Hatley/Pirbhai) supporting control flow diagrams. Promod/MD (Modular Design) provides an automatic transformation of analysis data from Promod/SART to design. Prosource (Source Code Generator) utilizes data from Promod/MD to generate source code frames in either the Ada language or the C language.

QASE RT by Advanced System Technologies, Inc.

Product Information:

Version Number: 1.3.2
 Date of Last Release: 6 December 1992
 Date of First Release: 1 November 1990
 Number Sold: ---
 Single User Price: \$12,300

Contact Information:

Point of Contact:

Name: Melinda Hackstaff
 Address: 12200E. Briarwood Ave.
 #260
 Englewood, CO 80112
 Phone Number: 303-790-4242 x124
 Fax Number: 303-790-2816
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	✓ Metrics
✓ Design	✓ Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	✓ Databases
Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

QASE RT (Quantitative CASE Reliability and Timing) is a performance analysis tool that enables system developers to use Macintosh's graphical interface to describe visually the components of a proposed system and then use the power of both analytical models and discrete event simulation models incorporated in the product (or capable of being developed using the product) to estimate the performance of the system.

QuickChart by Iconix

Product Information:

Version Number: 1.3
Date of Last Release: ---
Date of First Release: ---
Number Sold: ---
Single User Price: \$995

Contact Information:

Point of Contact:

Name: Pam Johnson
Address: 2800 28th St., Suite 320
Santa Monica, CA 90405
Phone Number: 310-458-0092
Fax Number: 310-396-3454
E-mail Address: apple1.nk.iconix

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
√ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

QuickChart supports Yourdon/Constantine Structured Design (with Page-Jones extensions), including support for Structure Chart Editing, Data Dictionary, and Language Sensitive Editors for a variety of languages.

Rational Environment by Rational

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: --- Number Sold: --- Single User Price: ---	Contact Information: Point of Contact: Name: Marketing Department Address: 3320 Scott Boulevard Santa Clara, CA 95054-3197 Phone Number: 408-496-3600 Fax Number: 408-496-3636 E-mail Address: ---
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Lifecycle Phases and Activities:

<input checked="" type="checkbox"/> Analysis <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Coding <input checked="" type="checkbox"/> Testing <input checked="" type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Environment Other:	Configuration Management Project Management Requirements Management <input checked="" type="checkbox"/> Documentation Simulation Quality Assurance	Metrics Reuse Ada Compilers Databases Process Technologies Reengineering
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Intended Customers:

<input checked="" type="checkbox"/> All MIS	Technical (Engineering) Real-time	Hard Real-time: Other:
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Primary Methodology:

<input checked="" type="checkbox"/> Structured	<input checked="" type="checkbox"/> Object-Oriented	<input checked="" type="checkbox"/> Behavior-Oriented
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Configurations:

 IBM RS/6000 (UNIX)

Description/Purpose:

The Rational Environment is an integrated, interactive Ada development environment. It supports and enforces, with a high degree of automation, modern software engineering practices throughout all phases of the lifecycle. It provides syntactic and semantic checking, design rule checking, incremental compilation, and automated system builds. Automatic document generation supports DOD-STD- 2167A requirements. Support for industry-standard protocols allows integration with new or existing project support environments.

RDD-100 System Designer by Ascent Logic Corp.

Product Information:

Version Number: 3.0.2.2
Date of Last Release: 01 Feb 1993
Date of First Release: 1988
Number Sold: 1,000
Single User Price: ---

Contact Information:

Point of Contact:

Name: Tamsin Barnes
Address: 4600 S. Ulster St., Suite 700
Denver, CO 80237
Phone Number: 303-740-6726
Fax Number: 303-740-6741
E-mail Address: barnes@alc.com

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	✓ Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
✓ Maintenance	✓ Simulation	✓ Process Technologies
Environment	✓ Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

Sun (SunOS), DEC 5100, IBM RS/6000, Mac II, HP 9000

Description/Purpose:

RDD-100 is a systems engineering automation technology intended for use on large, complex projects over the entire software lifecycle. It promotes avoidance of costly design flaws, achievement of predicted results, and enhanced productivity by managing the data constituting the system-level design. RDD-100 features a comprehensive database schema that is user-extensible, a modern GUI, multidimensional traceability, system modeling using several popular diagramming techniques, system simulation, automatic database consistency checking, automatic specification generation, and change control support.

Re/NuSys Workbench by Scandura Intelligent Systems

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 150
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Alice Scandura, Ph.D.
 Address: 1249 Greentree Lane
 Narberth, PA 19072
 Phone Number: 215-664-1207
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

IBM XT/AT/PS2, Sun Workstation, IBM RS/6000 (PC/MS DOS, OS/2, UNIX, ULTRIX)

Description/Purpose:

The Re/NUSys Workbench is a full lifecycle design, development, and maintenance product with special emphasis on software recycling (software recycling involves system renewal via reverse engineering, redesign, and code reuse). The product enables the user to reverse engineer existing code into a visual, hierarchical FLOWform windowing environment where it can be documented, restructured, reused, or reconverted to a new language. The product provides facilities that enable the user to model any existing or planned system and test its logic at a high level of abstraction. Successive refinement is continued until contact is made with available data and process resources.

Requirements & Traceability Management (RTM) by Marconi Systems Technology

Product Information:

Version Number: 2.0
Date of Last Release: March 1993
Date of First Release: 1989
Number Sold: 300
Single User Price: ---

Contact Information:

Point of Contact:

Name: Paul Raymond
Address: 4115 Pleasant Valley Road
#100
Chantilly, VA 22043
Phone Number: 703-263-1260
Fax Number: 703-263-1533
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	✓ Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured (none)	Object-Oriented	Behavior-Oriented
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Configurations:

Sun SPARC (SUN OS 4.1.3), VAX (VMS), HP 9000 - 700 (HP-UX), IBM RS/6000 (AIX)

Description/Purpose:

RTM is a fully configurable system for tracing requirements to any information across a full project lifecycle. Integrations with Cadre's Teamwork and IDE's Software through Pictures provide a direct access to RTM menus for automated data capture and consistency checking. Requirements documents may be rebuilt in Interleaf or Framemaker format for quality reporting. Within RTM, user defined objects allow any type of data to be stored in the RTM database providing traceability to other objects such as code modules, test specifications, and documentation. RTM is X- Windows/Motif-based and uses either Oracle or Ingres as its underlying database.

Robochart by Digital Insight

Product Information:

Version Number: 2.4
 Date of Last Release: August 1992
 Date of First Release: ---
 Number Sold: ---
 Single User Price: \$495

Contact Information:

Point of Contact:

Name: Lynn Morrison
 Address: P.O. Box 533
 Simi Valley, CA 93062-0533
 Phone Number: 805-583-3627
 Fax Number: 805-583-3809
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	✓ Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS), Sun 3/4 (Sun OS)

Description/Purpose:

Robochart is an interactive graphics editor that quickly and easily creates all types of flow diagrams.

RTrace by Protocol, A Division of Zycad Corp.

Product Information:

Version Number: 1.2.1
 Date of Last Release: April 1993
 Date of First Release: 1985
 Number Sold: 320
 Single User Price: \$10,000

Contact Information:

Point of Contact:

Name: Nancy Rundlet
 Address: 100 Enterprise Drive
 Suite 500
 Rockaway, NJ
 Phone Number: 201-989-2900
 Fax Number: 201-989-2940
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	√ Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	√ Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured (none)	Object-Oriented	Behavior-Oriented
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Configurations:

DEC VAX, Sun 3/4, Sun SPARC, IBM RISC/6000

Description/Purpose:

RTrace is a Protocol software product that provides tools to help establish and report traceability, organize and analyze requirements, and establish and report requirement allocation to components. While RTrace is uniquely suited to DOD-STD-2167A development, you can use RTrace with any lifecycle method and demonstrate requirements traceability mandated by any development standard.

SDL Design Tool by TeleLOGIC

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: ---

Contact Information:

Point of Contact:

Name: Marketing Department
 Address: Box 4128, Malmö, S-203 12
 Sweden
 Phone Number: +46 40174700
 Fax Number: +46 40174747
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	✓ Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

Structured	Object-Oriented	✓ Behavior-Oriented
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Configurations:

DEC VAX, HP 9000, IBM RS/6000, IBM XT/AT/PS2, Sun 3/4 (MS DOS, UNIX, VMS)

Description/Purpose:

SDT (SDL Design Tool) is a design and program generation tool that supports the CCITT specification and description language, SDL. Optional modules provide a graphical editor, a browser, an SDL syntax and semantics analyzer module, a simulator for SDL systems, C program generator, a syntax converter for SDL system descriptions, a complexity analyzer, and a report generator.

SES/Workbench by Scientific and Engineering Software

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 255
Single User Price: \$19,500 - \$57,900

Contact Information:

Point of Contact:

Name: Marketing Department
Address: 4301 Westbank Drive
Building A
Austin, TX 78746
Phone Number: 512-328-5544
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	Object-Oriented	✓ Behavior-Oriented
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Configurations:

Sun Workstation, Apollo Workstation, DEC Workstation, HP Workstation, IBM RS/6000 (VMS, UNIX)

Description/Purpose:

SES/Workbench provides capabilities to evaluate the performance impact of system architectural design decisions. Both hardware and software can be modeled. The product enables the simulation of communications networks, multiprocessor systems, distributed processing systems, large databases, and other complex systems.

Silverrun by Computer Systems Advisers

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 4,800
 Single User Price: \$2,500 - \$10,000

Contact Information:

Point of Contact:

Name: Anthony DeTaranto
 Address: 50 Tice Boulevard
 Woodcliff Lake, NJ 07675
 Phone Number: 1-800-537-4262
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	✓ Databases
Maintenance	Simulation	✓ Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2, Microsoft Windows), Apple Macintosh

Description/Purpose:

Silverrun is a planning, analysis, and design tool made up of four basic modules – Silverrun-ERX (Entity Relationship Expert), Silverrun-DFD (Data Flow Diagrammer), and Silverrun-WRM (Workstation Repository Manager). Each module is available separately; however, they are designed for integrated operation. Silverrun-WRM provides workgroup support capabilities. Silverrun provides consistent graphics interface capabilities across the multiple modules, on-screen icons, and immediate access to application generation capabilities and reverse engineering.

smartCASE by Cadware, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 500
 Single User Price: \$299

Contact Information:

Point of Contact:

Name: Frank Garvey
 Address: 50 Fitch Street
 New Haven, CT 06515
 Phone Number: ---
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

√ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	√ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

√ Structured √ Object-Oriented √ Behavior-Oriented

Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

smartCASE is a PC-based diagramming and documentation tool that serves as a first step into CASE technology. The product supports structured methods, information methods, and object-oriented methods, as well as organization charting techniques. smartCASE supports interfaces to popular word processors, thereby enabling the user to readily link charts and diagrams to text documents. The user can access up to four different word processing applications for minispecifications, notes, pseudo code, and other textual requirements.

SmartChart by Iconix

Product Information:

Version Number: 2.04
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: ---
 Single User Price: \$995

Contact Information:

Point of Contact:

Name: Pam Johnson
 Address: 2800 28th St., Suite 320
 Santa Monica, CA 90405
 Phone Number: 310-458-0092
 Fax Number: 310-396-3454
 E-mail Address: applelink:iconix

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All MIS	Technical (Engineering) Real-time	Hard Real-time: Other:
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Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

SmartChart supports detailed design with automatic structure chart generation from Program Design Language, processes hierarchy charts with FreeFlow and includes language sensitive editors for a wide variety of languages.

SMARTsystem by ProCASE Corporation

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 850
 Single User Price: \$2,000 - \$10,000

Contact Information:

Point of Contact:

Name: George Symons
 Address: 3130 De La Cruz Blvd.
 Suite 100
 Santa Clara, CA 95054
 Phone Number: 408-727-0714
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Sun Workstation, Apollo Workstation, DEC Workstation, IBM RS/6000 (UNIX, ULTRIX)

Description/Purpose:

SMARTsystem (for Software Maintenance, Analysis, and Reengineering Tools) is a suite of tools that provides an integrated, multiuser environment for software development, comprehension, maintenance, and reengineering in the C language. While it is a development product in the sense that system enhancements can be considered development, the primary focus of SMARTsystem is to help comprehend existing code as a basis for maintenance and reengineering. SMARTsystem is structured around an object-oriented database and is comprised of five modules that work individually or in unison – SMARTview, SMARTcheck, SMARTgraph, SMARTstore, and SMARTmake (which includes SMARTdebug).

Softbench/Softbench C++ by Hewlett-Packard Company

Product Information:

Version Number: 3.0
 Date of Last Release: November 1992
 Date of First Release: January 1990
 Number Sold: 20,000
 Single User Price: \$2,300

Contact Information:

Point of Contact:

Name: Chuck Dahl
 Address: 15815 SE 37th Street
 Bellevue, WA 98006
 Phone Number: 206-643-8784
 Fax Number: 206-643-8743
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

HP (HP-UX), Sun (Sun /OS)

Description/Purpose:

Softbench is a full-scale environment for C, C++, FORTRAN, and Pascal development. The environment includes a comprehensive set of integrated program construction tools to develop new applications and to port and maintain existing applications. The tools are united by the de facto standard Softbench framework. New tools can be added to the framework using the Softbench environment and is based on the UNIX system and supports the X Window System version 11, the OSF/Motif user interface, and Open Windows 2.0.

SoftTest by Bender and Associates

Product Information:

Version Number: 4.0
Date of Last Release: 15 February 1993
Date of First Release: 1 October 1987
Number Sold: 200
Single User Price: \$2,500

Contact Information:

Point of Contact:

Name: Blaine Bragg
Address: 484 Magnolia Ave.
P.O. Box 847
Larkspur, CA 94939
Phone Number: 415-924-9196
Fax Number: 415-924-3020
E-mail Address: blaine@well.sfca

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
Design	Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

IBM XT/AT/PS2 (DOS 3.1 or higher)

Description/Purpose:

SoftTest is a functional test case design tool that generates the minimum yet sufficient set of tests required to ensure 100 percent functional coverage during testing. Test cases designed using SoftTest will increase the effectiveness of the testing process by increasing functional code coverage. SoftTest will also increase the efficiency of testing by reducing the number of required functional test cases.

Software Engineering Toolkit by Caset Corporation

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 350
 Single User Price: \$2,000 - \$7,450

Contact Information:

Point of Contact:

Name: Martin Cody
 Address: 33751 Connemara Dr.
 PO Box 939
 San Juan Capistrano, CA
 92693
 Phone Number: 714-496-8670
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	Object-Oriented	✓ Behavior-Oriented
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Configurations:

Sun, Apollo, DEC, HP, Silicon Graphics (VMS, UNIX, ULTRIX, Microsoft Windows)

Description/Purpose:

Software Engineering Toolkit (SET) is a product suite that provides facilities to develop, prototype, and test the "user interface" elements (menus, screens, windows, etc.) of an application. SET allows developers to generate the appearance along with the behavioral modeling of a Motif-compliant user interface. Use of SET requires minimal knowledge of X Windows or Motif programming. SET compliments this development environment with integrated raster and vector graphics

Software Engineering Environment System by Delphi Group

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 19
Single User Price: \$1,000 - \$10,000

Contact Information:

Point of Contact:

Name: Luis Rivera
Address: 16980 Via Tazon, Ste. 290
San Diego, CA 92127
Phone Number: ---
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	✓ Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	✓ Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2, Microsoft Windows), Apple Macintosh

Description/Purpose:

Software Engineering Environment (SEE) System is a lifecycle management system that (1) provides capabilities for interfacing/integrating a variety of design, analysis, and programming CASE tools, (and other IS tools as well), thereby enabling the user to create an integrated programming support environment (IPSE) tailored to the specific needs of a project, (2) tracks work in progress and completion of deliverables in a variety of tools, and (3) provides an on-line methodology and project management capabilities.

Software through Pictures by Interactive Development Environments

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: --- Number Sold: 5,400 Single User Price: \$5,000 - \$21,000	Contact Information: Point of Contact: Name: Anthony J. Wasserman Address: 595 Market Street, 10th Floor San Francisco, CA 94105 Phone Number: 415-543-0900 Fax Number: --- E-mail Address: ---
---	---

Lifecycle Phases and Activities:

<ul style="list-style-type: none"> ✓ Analysis ✓ Design ✓ Coding ✓ Testing ✓ Maintenance ✓ Environment Other: 	<ul style="list-style-type: none"> Configuration Management Project Management Requirements Management ✓ Documentation Simulation Quality Assurance 	<ul style="list-style-type: none"> Metrics Reuse Ada Compilers Databases Process Technologies Reengineering
---	---	---

Intended Customers:

<ul style="list-style-type: none"> ✓ All MIS 	<ul style="list-style-type: none"> Technical (Engineering) Real-time 	<ul style="list-style-type: none"> Hard Real-time: Other:
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Primary Methodology:

<ul style="list-style-type: none"> ✓ Structured 	<ul style="list-style-type: none"> Object-Oriented 	<ul style="list-style-type: none"> Behavior-Oriented
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Configurations:

Sun Workstation, Apollo Workstation, DEC Workstation, HP Workstation, Silicon Graphics, IBM RS/6000 (VMS, UNIX, ULTGRIX, Microsoft Windows)

Description/Purpose:

Software through Pictures (STP) consists of a suite of nearly 100 integrated tools, including a set of graphics tools linked to a central data dictionary and a set of consistency-checking tools that provide a complete system for systems development and maintenance. The product supports all popular structured analysis and design methodologies. The product supports requirements analysis, design, code generation, and documentation of software systems for both technical (real-time embedded/non-embedded) and commercial (information systems) applications. The product includes user-extensible applications that are built upon template-driven tools and an object-oriented dictionary.

SQL*Builder by SQL*Builder Software Company

Product Information:

Version Number: 3.1
Date of Last Release: ---
Date of First Release: June 1989
Number Sold: 200
Single User Price: ---

Contact Information:

Point of Contact:

Name: Marketing Department
Address: 615 East Michigan Street
Milwaukee, WI 53202
Phone Number: 414-278-0500
Fax Number: 414-278-0298
E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured ✓ Object-Oriented ✓ Behavior-Oriented

Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2), XENIS, UNIX, VMS

Description/Purpose:

SQL*Builder is a rule-based, object-oriented development system that lets users quickly and easily create applications in a SQL environment. Designers can define application building blocks, i.e., windows, fields, and procedures, which can be used and reused to construct other objects throughout the application or product family. Centralized business rules and objects deliver substantial productivity gains and provide a single point of reference.

Statemate by i-Logix, Inc.

Product Information:	Contact Information:
Version Number: 4.5	Point of Contact:
Date of Last Release: September 1992	Name: Michael F. Kelly
Date of First Release: March 1987	Address: 22 3rd Avenue
Number Sold: 1,000	Burlington, MA 01803
Single User Price: \$20,000 - \$30,000	Phone Number: 617-272-8090
	Fax Number: 617-272-8035
	E-mail Address: mike@ilogix.com

Lifecycle Phases and Activities:		
✓ Analysis	✓ Configuration Management	Metrics
✓ Design	✓ Project Management	✓ Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other: HDL generation (VHDL or Verilog)		

Intended Customers:		
All	✓ Technical (Engineering)	✓ Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:		
✓ Structured	Object-Oriented	✓ Behavior-Oriented

Configurations:
DECstation, VAXstations, Sim SPARC stations, HP/Apollo workstations, IBM RS/6000, Hewlett Packard 700 Series

Description/Purpose:
Statemate is a front-end design tool used to model the functions and behavior of real-time reactive systems. The graphical interfaces simplify the entry process, while the mathematics behind the graphics enable the computer to perform exhaustive analysis to ensure system integrity. Rapid prototyping, executable specifications, and source code generation are all available with Statemate. Express-V-HDL uses the same front-end graphics, simulation, and analysis as Statemate. ExpressV- HDL can produce fully simulatable or synthesisable HDLs for use in EDA tools.

Sterling Developer by Sterling Software

Product Information:

Version Number: 4.1.1
Date of Last Release: 30 September 1992
Date of First Release: 30 September 1985
Number Sold: 500
Single User Price: \$3,000

Contact Information:

Point of Contact:

Name: Steve Brown
Address: 36 Antares Drive
Ottawa, Ontario, K2E 7W5
Phone Number: 1-800-267-9972
Fax Number: 613-786-4848
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	Metrics
✓ Design	✓ Project Management	Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	✓ Process Technologies
Environment	✓ Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2, Microsoft Windows)

Description/Purpose:

Sterling Developer is a highly customizable analysis, modeling, and design tool that operates in Microsoft Windows or OS/2 Presentation Manager. Sterling Developer provides multiple users with shared access to Microsoft SQL Server for the benefit of shared access and information reusability. The centralized repository enables users to work with a common synchronized database of application design information. Data, diagrams, matrices, report layouts, and graphic icons are among the objects that can be stored in the repository. Repository-based metadata ensures common data standards are followed and duplication is eliminated. Methodology and technique independence enable Sterling Developer to custom tailor to specific needs. Common applications are software engineering, business engineering, repository management, and structured testing.

superCASE by Advanced Technology International

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 45
 Single User Price: \$31,000 - \$65,000

Contact Information:

Point of Contact:

Name: Gonen Ziv
 Address: 350 5th Ave., Suite 1925
 New York, NY 10036
 Phone Number: 212-947-0086
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	✓ Hard Real-time:
MIS	✓ Real-time	Other:

Primary Methodology:

Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

DEC VAX (VMS)

Description/Purpose:

superCASE is a suite of tools that provides an integrated software development environment spanning forward engineering, reverse engineering, and maintenance – primarily for real-time systems. superCASE consists of a "basic system", which provides a core set of functions and capabilities, and a set of optional functions and capabilities from which the purchaser may choose in creating the superCASE configuration that meets its specific needs. The product is designed to support simultaneous development by large project teams and provides the capability to go from design specifications to generated code.

Synon/2E by Synon, Inc.

Product Information:

Version Number: 4.0
Date of Last Release: January 1993
Date of First Release: January 1986
Number Sold: 4,000
Single User Price: \$40,000

Contact Information:

Point of Contact:

Name: Patricia Gallery
Address: 1100 Larkspur Landing Circle
Larkspur, CA 94939
Phone Number: 415-461-8815
Fax Number: 415-461-4239
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	✓ Databases
✓ Maintenance	Simulation	Process Technologies
✓ Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

AS/400, OS/2, AIX, Client/Server

Description/Purpose:

Synon/2E is a CASE tool used for application design and code generation on the AS/400, RS/6000 and on the PS/2 client/server environment.

System Architect by Popkin Software & Systems, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 11,000
 Single User Price: \$1,395 - \$2,940

Contact Information:

Point of Contact:

Name: Steven Schroer
 Address: 11 Park Place
 New York, NY 10007-2801
 Phone Number: 212-571-3434
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, OS/2, Microsoft Windows)

Description/Purpose:

System Architect is a PC-based product that primarily supports the requirements and design phases of the system development lifecycle. The product runs under Microsoft Windows and IBM's OS/2 Presentation Manager. The product supports a variety of system development methodologies, including Yourdon/DeMarco, Gane/Sarson, SSADM (United Kingdom methodology), and Ward/Mellor (real-time). It also supports object-oriented design, structure charts, state transition diagrams, decomposition diagrams, entity-relationship diagrams, flowcharts, and presentation annotation and provides support for three specific object-oriented analysis and design techniques – Booch 91, the Coad/Yourdon technique, and Schlaer/Mellor.

STSC RAD Product Sheet Version 2.0b

System Developer I by Cadware, Inc.

Product Information:

Version Number: ---
Date of Last Release: ---
Date of First Release: ---
Number Sold: 3,000
Single User Price: \$499 - \$749

Contact Information:

Point of Contact:

Name: Frank Garvey
Address: 50 Fitch Street
New Haven, CT 06515
Phone Number: ---
Fax Number: ---
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
Maintenance	Simulation	✓ Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS)

Description/Purpose:

System Developer I is an analysis and design CASE tool that incorporates: (1) automated standard software engineering techniques for structured analysis and structured design, (2) a diagram editor, (3) a team-level data dictionary, (4) a documentation facility, (5) an application interface facility, and (6) prototyping and COBOL screen code generation.

TAGS by Teledyne Brown Engineering

Product Information: Version Number: --- Date of Last Release: --- Date of First Release: 1984 Number Sold: --- Single User Price: \$1,250 - \$11,500	Contact Information: Point of Contact: Name: Lisa Schuler Address: 300 Sparkman Drive NW P.O. Box 070007 Huntsville, AL 35807-7007 Phone Number: 205-726-1482 Fax Number: 205-726-1033 E-mail Address: ---
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Lifecycle Phases and Activities:

<ul style="list-style-type: none"> ✓ Analysis ✓ Design ✓ Coding ✓ Testing ✓ Maintenance 	Configuration Management Project Management Requirements Management Documentation Simulation Quality Assurance	Metrics Reuse Ada Compilers Databases Process Technologies Reengineering
Environment Other:		

Intended Customers:

All MIS	Technical (Engineering) ✓ Real-time	✓ Hard Real-time: Other:
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Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

DEC RISC, DEC VAX, HP Apollo X500, IBM XT/AT/PS2, IBM RS/6000, Sun 3/4 (OS/2, UNIX)

Description/Purpose:

TAGS (Technology for Automated Generation of Systems) is a CASE environment that supports the full DOD-STD-2167A lifecycle for real-time and embedded systems. Based on a graphical, executable specification language, called Input/Output Requirements Language (IORL), with formal syntax and semantics that can describe a system structure and function.

Teamwork by Cadre Technologies, Inc.**Product Information:**

Version Number: 4.1
 Date of Last Release: June 1992
 Date of First Release: January 1991
 Number Sold: 24,000
 Single User Price: \$2,065 - \$6,965

Contact Information:**Point of Contact:**

Name: Doug Trolan
 Address: 19545 NW Von Neumann Dr.
 Beaverton, OR 97006
 Phone Number: 301-897-4101
 Fax Number: 301-897-3106
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	✓ Metrics
✓ Design	Project Management	Reuse
✓ Coding	✓ Requirements Management	Ada Compilers
Testing	Documentation	✓ Databases
Maintenance	✓ Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

Sun (Sun OS or Solaris), HP (HP UX), RS6000 (AIX), DEC (ULTRIX), SGI (IRIX), DEC (VMS), OS/2, Apollo(DOMAIN)

Description/Purpose:

Teamwork is a suite of tools that include the following: Teamwork/ADA-ALL, Teamwork/DocGen(DPI), Teamwork/IM, Teamwork/OOA, Teamwork/OOD for C++, Teamwork/RqT, Teamwork/RT, Teamwork/SA, Teamwork/SD and Teamwork/SIM and FSIM (5.0). Information on each tool provided by the STSC on request.

STSC RAD Product Sheet Version 2.0b

The Manager Family by Manager Software Products, Inc.

Product Information:

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 1,800
 Single User Price: \$50,000 - \$250,000

Contact Information:

Point of Contact:

Name: Lesley Tyler
 Address: 131 Hartwell Avenue
 Lexington, MA 02173-5800
 Phone Number: 617-863-5800
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2, IBM 43xx, IBM 303/4x, IBM 308x, IBM 3090, Amdahl, NAS
 (PC/MS DOS, DOS (Mainframe), MVS, VM, VSE, TSO, CMS, CICS)

Description/Purpose:

The Manager Family of software products is a dictionary-driven, integrated set of facilities that supports computer-aided systems engineering throughout the systems lifecycle. Datamanager is the data and information resource management system corporate dictionary/repository. Controlmanager is the end-user facility for the Manager family. Designmanager is the interactive data and enterprise modeling system for logical and physical database design. Dictionary Manager is an interchange system that supports the exchange of definitions between multiple vendor dictionaries directories. Managerview is the intelligent workstation-based graphical information engineering tool driven by the mainframe resident corporate dictionary/repository. Sourcemanager is the on-line application development system.

TreeSoft 2.1 by +1 Software

Product Information:

Version Number: 2.1
 Date of Last Release: 01 June 1992
 Date of First Release: 27 Nov 1990
 Number Sold: ---
 Single User Price: \$6,500

Contact Information:

Point of Contact:

Name: John Dempsey
 Address: 2510-G Las Posas Rd.
 Suite 438
 Camarillo, CA 93010
 Phone Number: 805-389-1778
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	Metrics
✓ Design	✓ Project Management	✓ Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
✓ Environment	✓ Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

Sun-3, Sun-4 (SunOS)

Description/Purpose:

TreeSoft 2.1 is a software engineering environment that supports the development of application and real-time software written in one or more programming languages. TreeSoft can be used over a local area network to support a group of programmers working in parallel on a common project. TreeSoft 2.1 currently runs on Sun Workstations running SunOS, but can be ported to most Unix-based platforms. TreeSoft 2.1 supports project modeling, generation of makefiles, graphical viewpaths, configuration management, profiling, project communications, report generation, selective reuse, and default editing.

TurboCASE by StructSoft**Product Information:**

Version Number: ---
 Date of Last Release: ---
 Date of First Release: ---
 Number Sold: 680
 Single User Price: \$495 - \$995

Contact Information:**Point of Contact:**

Name: Shang-Cheng Chyou
 Address: 5416 156th Avenue SE
 Bellevue, WA 98006
 Phone Number: 206-644-9834
 Fax Number: ---
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

Apple Macintosh

Description/Purpose:

TurboCASE primarily supports the analysis phase of the system development lifecycle, although it does provide some capabilities that address design. It supports multiple methodologies including the structured analysis approaches of Yourdon/Demarco and Gane/Sarson, Ward/Mellor, Hatley/Pirbhai, and ESML (Extended System Modeling Language) real-time modeling, Chen's entity-relationship data modeling, and the Palmer and McMenamin Essential Systems Analysis methodology. In addition to supporting structured analysis, it also supports object-oriented concepts.

Virtual Software Factory by Virtual Software Factory Ltd.

Product Information:

Version Number: 3.8
Date of Last Release: December 1992
Date of First Release: ---
Number Sold: ---
Single User Price: \$6,000

Contact Information:

Point of Contact:

Name: Matthew Granger
Address: 13873 Park Center Road
Suite 218
Herndon, VA 22071
Phone Number: 703-318-1190
Fax Number: 703-318-1190
E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	✓ Configuration Management	✓ Metrics
✓ Design	✓ Project Management	✓ Reuse
Coding	✓ Requirements Management	Ada Compilers
Testing	✓ Documentation	Databases
✓ Maintenance	Simulation	✓ Process Technologies
✓ Environment	✓ Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

✓ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	✓ Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS), Sun SPARC (Sun OS, Motif), DECstation (ULTRIX), VAXstation (VMS), IBM RS/6000 (AIX)

Description/Purpose:

The Virtual Software Factory (VSF) is able to provide CASE solutions for any method or combination of methods. It is the ideal solution for businesses and projects that have their own design methods or documentation standards to support, creating the opportunity to rapidly establish high-performance, multiwindow, menu-driven CASE tool support for the precise method combination that is required, together with the ability to evolve the chosen methodology with time. VSF tool solutions support design rule and data integrity-checking at the point of data entry, to capture and contain problems early.

Visible Analyst Workbench by Visible Systems, Corp.

Product Information:

Version Number: 4.3
 Date of Last Release: 01 December 1992
 Date of First Release: 1985
 Number Sold: 7,000
 Single User Price: \$1,895 - \$4,715

Contact Information:

Point of Contact:

Name: Bruce Fanning
 Address: 950 Winter Street
 Waltham, MA 02154
 Phone Number: 617-890-2273
 Fax Number: 617-890-8909
 E-mail Address: ---

Lifecycle Phases and Activities:

✓ Analysis	Configuration Management	Metrics
✓ Design	Project Management	✓ Reuse
✓ Coding	Requirements Management	Ada Compilers
✓ Testing	✓ Documentation	✓ Databases
✓ Maintenance	Simulation	✓ Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows)

Description/Purpose:

Visible Systems, Corp. is involved in the development of multiuser, multiwindow, multi-method, PC-based I-CASE tools. The Visible Analyst Workbench is a repository-based CASE tool that integrates planning, analysis, design, construction, and reverse engineering.

VisualWorks by ParcPlace Systems, Inc.

Product Information:

Version Number: 1.0
Date of Last Release: ---
Date of First Release: November 1992
Number Sold: ---
Single User Price: \$2,995 - \$4,995

Contact Information:

Point of Contact:

Name: Marketing
Address: 999 East Arques Avenue
Sunnyvale, CA 94086
Phone Number: 408-481-9090
Fax Number: 408-481-9095
E-mail Address: sales@parcplace.com

Lifecycle Phases and Activities:

Analysis	Configuration Management	Metrics
√ Design	Project Management	√ Reuse
√ Coding	Requirements Management	Ada Compilers
√ Testing	Documentation	Databases
√ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	Reengineering
Other:		

Intended Customers:

√ All	Technical (Engineering)	Hard Real-time:
MIS	Real-time	Other:

Primary Methodology:

Structured	√ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows, OS/2), NeXT, HP (HP-UX),
DEC (ULTRIX), IBM RS/6000 (AIX), Apple Macintosh, Sun (Sun OS, Solaris)

Description/Purpose:

VisualWorks is an object-oriented application development environment for developers who create GUI-based client-server applications that are completely portable across PC, Macintosh, and UNIX platforms.

Xinotech Program Composer by Xinotech Research, Inc.

Product Information:

Version Number: 2.0
 Date of Last Release: January 1993
 Date of First Release: September 1991
 Number Sold: ---
 Single User Price: \$2,250 - \$3,000

Contact Information:

Point of Contact:

Name: Katherine Myers
 Address: 1313 5th Street SE, Suite 213
 Mpls., MN 55414
 Phone Number: 612-379-3844
 Fax Number: 612-379-3875
 E-mail Address: ---

Lifecycle Phases and Activities:

Analysis	Configuration Management	✓ Metrics
✓ Design	Project Management	Reuse
Coding	Requirements Management	Ada Compilers
Testing	Documentation	Databases
✓ Maintenance	Simulation	Process Technologies
Environment	Quality Assurance	✓ Reengineering
Other:		

Intended Customers:

All	✓ Technical (Engineering)	Hard Real-time:
✓ MIS	Real-time	Other:

Primary Methodology:

✓ Structured	✓ Object-Oriented	Behavior-Oriented
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Configurations:

IBM XT/AT/PS2 (PC/MS DOS, Microsoft Windows), Sun SPARC (UNIX)

Description/Purpose:

The Xinotech Program Composer is an interactive tool for the design and construction of programs. The composer is a professional tool designed to be the front-end component of CASE environments, while providing the integration of related CASE tools such as compilers, directories, and design language processors. The Composer is a productivity tool that implements software engineering principles aimed at enforcing the standards proposed by management, automating the development practices suggested by project leaders, and bringing powerful technology to the hands of designers and programmers.

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Appendix C: Upper CASE Products – Product Critique Format

This appendix contains the format of the Upper CASE product critique. User critiques are written by actual product users. Editing by the STSC will be kept to an absolute minimum. A critique has five sections: (1) Name, (2) Evaluation Context, (3) Strengths and Weaknesses, (4) Additional Comments, and (5) Vendor Comments. The purpose of the evaluation context section is to give a critique reader an idea of the biases of the evaluator and the applicability of the critique to the reader's context. The strengths and weaknesses, and additional comments sections allow the evaluator free-form commentary about the product. The vendor comments section allows a response by the product vendor.

The STSC actively requests and uses product critiques from experienced product users. These critiques highlight the experiences (good and bad) of actual product users. If you are a user of a product that is or should be in the product list and would like to write a critique, please contact the STSC. An example product critique is found in Appendix C, Upper CASE Product Critique Format. The Upper CASE team has collected 12 Upper CASE Technology critiques. The tools that have been critiqued are listed in Appendix C. Please contact the Upper CASE team for these and additional critiques.

This STSC has collected critiques on the following tools. Please contact the STSC for specific information.

Critique List

Paradigm Plus
Statemate
ObjectMaker
Teamwork Ada
Teamwork SA/RT
Ensemble
Geode
Teamwork
IEW
AGE/GEODE
MatrixX/SystemBuild/AutoCode
Software through Pictures

Tool Critique

Reviewer's Profile: Company Profile: _____ Position/Title: _____ Main Duties: _____ _____ Years of software experience: _____ Years of experience with the tool: _____ Last time tool used: _____ Currently 6 months 1 year >1 year I am a software: _____ Manager Engineer Programmer Novice Date of Review: _____	Tool Profile: Vendor: _____ Version: _____ Hardware platform: _____ Operating system: _____ Memory used: _____ Disk space used: _____ Enhancements: _____ (accelerator, large monitor, graphics card, etc.) Overall impression of the tool? Excellent Good Fair Poor Quality of vendor support? Excellent Good Fair Poor Unknown
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Project Information
--

Notable Strength(s) of the Tool
--

Notable Weakness(es) of the Tool

Advice for Potential Buyers of this Tool

Vendor Response:

STSC RAD User Critique 2.0d

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Appendix D: Upper CASE Product Characteristics

D.1 Functional Upper CASE Tool Characteristics

The following sections identify the functional capabilities of Upper CASE tools. The evaluation of the functional capability of Upper CASE tools assesses the tool's capabilities. The STSC has categorized the functional capabilities of Upper CASE tools into eight main areas. These areas are delineated in Table D-1, Upper CASE Functional Areas. Each of these areas has even more detailed characteristics. For instance, the Model Analysis area includes consistency analysis, completeness analysis, behavior analysis, and four other tool characteristics. The complete list of these detailed characteristics are the level of abstraction at which tool selectors need cognizance, because it is at this level of detail that the selector specifies functionality requirements.

Information Capture	Data Repository
Methodology Support	Documentation
Model Analysis	Data Import/Export and Standardization
Requirements Tracing	Reusability Support

Table D-1. Upper CASE Tool Products

D.1.1 Information Capture

The information capture functionality area deals with what types of information the tool is capable of handling. This information can be captured in a number of ways. The important idea is what type of information is captured, not how it is captured. Table D-2, Upper CASE Tool Information Types, lists the types of information that Upper CASE tools capture.

- System Function Descriptions
- Data Descriptions of System Functions Interfaces
- Data Descriptions of System Input/Output Device Interfaces
- System Logical Behavior
- System Timing Behavior
- Hardware/Software Context
- Software Architectural Structure
- Software Process Definitions
- Software Data Structures
- Software Process Control
- Software Process Concurrency
- Software Interprocess Data Communication
- Software Interprocess Synchronization

Table D-2. Upper CASE Tool Information Types

D.1.2 Methodology Support

Methodology is the process the tool user follows to systematically develop correct and complete work products. A number of methodologies exist for requirements analysis and software design. The important ones that have been automated are listed in Table D-3, Upper CASE Methodologies.

• Real-Time Structured Development	• PAMELA
• Structured Analysis	• ESML
• Structured Design	• ADARTS
• Hatley/Pirbhai Extensions	• PAISLey
• Object-Oriented Design	• VDM
• Ada-Based Object-Oriented Design	• Petri Nets
• Object-Oriented Analysis	• Statecharts
• Entity Relationship Modeling	• Axiomatic Specification

Table D-3. Upper CASE Methodologies

These methodologies require that various work products be created by the user. Since different methodologies can require the same work products, the products are listed separately in Table D-4, Upper CASE Tool Products.

• Data Flow Diagrams	• Ada Package Dependency Diagrams
• System Context Diagrams	• Structure Charts
• Block Diagrams	• Flowcharts
• Control Flow Diagrams	• Screen and Report Diagrams
• Entity Relationship Diagrams	• User-Tailored Diagrams
• State Transition Tables	• Object Diagrams
• Petri Net Diagrams	• Object Hierarchy or Tree Diagrams
• Architecture Diagrams	• Object Interaction Diagrams

Table D-4. Upper CASE Tool Products

D.1.3 Model Analysis

The model analysis functionality area captures the techniques the tool uses to analyze the inputs. These techniques can be static or dynamic. They are used to prove qualities about the input requirements or specifications such as completeness or consistency. They are also

used to simulate the inputs at an early stage in the lifecycle. The important techniques are listed in Table D-5, Upper CASE Analysis Techniques.

- | | |
|----------------------------------|-----------------------------|
| • Consistency Checking | • Behavior Analysis |
| • Completeness Checking | • Scenario-Based Analysis |
| • Data Normalization Analysis | • Exhaustive Model Analysis |
| • Man/machine Interface Analysis | |

Table D-5. Upper CASE Analysis Techniques

D.1.4 Requirements Tracing

The requirements tracing functionality area captures the attributes associated with the tracing of requirements between software lifecycle phases. Requirements tracing is important because it facilitates the management of interlifecycle dependencies. The important attributes are listed in Table D-6, Requirements Tracing Attributes.

- | |
|---|
| • Extraction of Requirements from System and Software Documentation |
| • Inputs From Electronically Scanned Hard-Copy |
| • Multiple Requirements Baselines |
| • Tracing of System Requirements to Software Requirements |
| • Tracing of System Design Specifications to Software Requirements |
| • Tracing of Requirements to Software Design |
| • Tracing of Requirements to Source Code |
| • Tracing of Requirements to Software and System Test |

Table D-6. Requirements Tracing Attributes

D.1.5 Data Repository

The data repository functionality area captures the attributes associated with the database the tool uses. Most tools use proprietary databases. The database model presented to the user, the user interface to the database, and the extent to which the database can represent

software objects is critical to the database's overall functionality. The important attributes are listed in Table D-7, Upper CASE Data Repository Functional Attributes.

• Data Repository	• Contain Project Information
• Relational Database Type	• Contain Requirements Documents
• Object Database Type	• Contain Design Specifications
• Support both Text and Graphics	• Contain Source Code
• Query Capability	• Contain Test Descriptions and Procedures
• Access Control Capability	• Capacity Artificially Limited
• Concurrent Access to Entities	• Support Interactive Cross-Referencing
	Configuration Management Capability

Table D-7. Upper CASE Data Repository Functional Attributes

D.1.6 Documentation

The documentation functionality area captures the attributes associated with the documentation the tool produces. The important attributes are listed in Table D-8, Upper CASE Documentation Functional Attributes.

• Support Graphics/Text Integration	• Automatic Generation of Documentation
• Completely Compile a Document	• Rapid Draft Hard Copy
• On-Line Templates	• Interface to Other Document Generators
• 2167A Documentation Standard	• Desktop Publishing Interface

Table D-8. Upper CASE Documentation Functional Attributes

D.1.7 Data Import/Export and Standardization

The data import/export functionality area captures the attributes associated with how easily the tool can exchange data with other tools including other tools in the tool vendor's tool set. The important attributes are listed in Table D-9, Upper CASE Data Input/Output Functional Attributes.

- Between Toolkit Components (Intraoperability)
- With Other Tools (Interoperability)
- CAIS-A Interface Standards/Protocols Supported
- PCTE Compliance
- Compatibility with the evolving I-CASE environment

Table D-9 Upper CASE Data I/O Functional Attributes

The Common Ada Programming Support Environment (APSE) Interface Set (CAIS) is an environment-defining standard that has been popular with the military. Recently, the U.S. Departments of Defense and Commerce have shown interest in another CASE tool integration framework. They have shown support for the establishment of a North American Forum to supplement the Portable Common Tools Environment (PCTE) standards effort of the European Computer Manufacturers Association (ECMA). In addition, the National Institute of Standards and Technology (NIST) has sponsored an initiative to support a proposed CASE tool framework. NIST recommends that all government agencies support the PCTE framework, although it has not yet been adopted as standard.

The NIST/ECMA reference model supports both horizontal and vertical integration. Horizontal (methodological) integration ensures the consistency of information within each life-cycle phase when many modeling methods are used (such as data, process, event-driven, and object-oriented). Vertical (full lifecycle) integration ensures the consistency of information generated in the many lifecycle phases.

The Department of Defense (DoD) is supporting the development of a standard and integrated engineering environment with the I-CASE (Integrated Computer-Aided Software Engineering) program. I-CASE will provide engineers with a standard environment that will remain the same across services and across DoD agencies. I-CASE includes tools for business case analysis, requirements analysis, prototyping, and code generation. A central repository will be used to store tool data so that as technology is upgraded, an engineer can simply remove the older tool and put the new one in place. The draft request for I-CASE proposals was released by the Air Force in March 1992.

D.1.8 Reusability Support

The reusability functionality area captures the attributes associated with how the tool supports reuse. The one attribute in this area deals with support for library design components.

D.2 Quality

The following sections define and discuss the Upper CASE implications of the 12 quality attributes identified in the analysis phase. The quality attributes have dual implications, one for the Upper CASE tool and the other for its product. The Upper CASE tool and the product are considered distinct. A compiler is similar in that not only should the compiler itself be considered but the output (product) must also be considered. A fast compiler that produces slow executables has little value.

D.2.1 Efficiency

Upper CASE tool efficiency refers to the amount of utilization of a resource on a problem, using the Upper CASE tool. The three resources that need to be assessed are: (1) processor (time to complete a task), (2) memory (the secondary storage requirements to complete a task), and (3) communication (Input/Output and network considerations for multiprocessor systems or multiuser problems). For Upper CASE tools, efficiency is not expressed absolutely. Instead, it is expressed qualitatively in terms of acceptable, barely acceptable, or unacceptable. Several problems covering a range of sizes from small to large across each of the resources need to be assessed. When the tool performs adequately for a specific problem with respect to a particular resource, its efficiency is acceptable for that problem size and that resource. Barely acceptable performance occurs when the performance is acceptable but there is no room for performance growth.

Efficiency, as it applies to the products of Upper CASE tools, is not important because the products of these tools are paper reports. That the tools may support efficiency studies of their products, e.g., timing analysis of designs, is a matter of functionality and not quality.

D.2.2 Integrity

Integrity concerns either software security failures due to unauthorized access or the corruption of the database. As a policy, the tool users should lose confidence in the integrity of the database if unauthorized access is allowed. Database corruption may be caused by such actions as legal but partial or inconsistent operations and erroneous but allowed operations.

The integrity of the products of the tool is a non-issue. Accessibility to the products is usually governed by the operating system of the developmental machine and never by the tool. Once a product has been produced, it is no longer part of the database and can no longer be corrupted.

D.2.3 Reliability

Reliability concerns software failures. Reliability is normally measured by direct testing and analysis of error reports. With commercial software, direct testing is not feasible, and detailed error reports are not normally published. For Upper CASE tools, instead of directly measuring reliability, indicators such as maturity, published error reports, size of executable code, and errors uncovered during testing will be used.

Since the products of the Upper CASE tools are intermediate products of the entire software development process, their reliability cannot be tested.

D.2.4 Survivability

Survivability deals with the ability of the software to perform even when portions of the system have failed. This issue is usually not important in the evaluation of Upper CASE tools because the greater issue of system availability is not critical in an office environment. However, if the tool uses different hardware resources, i.e., networked workstations with a file server, the issue of how the tool handles hardware resource failure, i.e., file server shutdown must be addressed.

Survivability is not an issue for the tool products because they are reports.

D.2.5 Usability

Usability is the extent to which resources required to acquire, install, learn, operate, prepare input for, and interpret output of the tool or the tool products are minimized. This attribute is probably the most important and critical quality attribute for which Upper CASE tools are evaluated. This is the quality attribute in which tool vendors differentiate themselves through such quality criteria as user interfaces, user documentation, and training.

The usability of the products of the tool is not an important quality issue. The ability to customize reports is addressed in the documentation portion of the functional capabilities of the tool.

D.2.6 Correctness

Correctness is the extent to which software design and implementation conform to specifications and standards. The correctness of a tool is evaluated in other portions of the evaluation framework, namely the functional capability area. The reliability quality attribute addresses known errors.

The correctness of the tool products is important. The generated products should conform to the specification captured by the tool.

D.2.7 Maintainability

Maintainability is the ease of effort to locate and fix software failures within a specified time period. This attribute is not of importance to the tool user; instead, the time and ability for the vendor to deliver software maintenance is important. The tool user is not concerned with the effort required to perform these actions. This time is addressed in the vendor information portion of the evaluation framework (under management concerns).

This attribute is of importance to the the tool's user of the products, but not to the tool user. The tool products should possess the quality attributes of maintainability.

D.2.8 Verifiability (a.k.a. testability)

Verifiability deals with the design characteristics that facilitate the testing of the tool or the tool's products. The testing of the tool is important to the developers of the tool but not to the tool user (except that a well-tested tool will have higher reliability).

The ability to test the tool's products is important in determining the quality of the tool. But for Upper CASE tools, testing is best addressed as a functional capability of the tool.

D.2.9 Expandability (a.k.a. flexibility)

Expandability is the ease in which current functions can be enhanced or new functions added. Flexibility is defined as the ease with which the software can be changed to meet other new requirements. Within the scope of evaluating Upper CASE tools and Upper CASE tool products, where the viewpoint is user-implemented changes (not developer-implemented changes), these attributes are dealt with in the reusability quality attribute.

D.2.10 Interoperability

Interoperability is the ability of separate systems to exchange database objects and their relationships without conversion. This is an important area, capturing if, how much, and how well the Upper CASE tool implements data exchange standards. This area is addressed in the Functional Capabilities portion of the evaluation framework. It is not an important quality attribute for either Upper CASE tools or their products.

D.2.11 Reusability

Reusability is the extent to which a component can be adapted for use in another application. Within the scope of evaluating Upper CASE tools, reusability deals with how easily the tool can be used for other projects.

The issue of reusability of the products of the CASE tool is dealt with in the functional capabilities portion of the evaluation framework.

D.2.12 Transportability (a.k.a. Portability)

Transportability is the ability of a software item to be installed in a different environment without change in functionality. Within the scope of evaluating Upper CASE

tools, it deals with how many platforms and operating systems with which the tool works. This area is addressed in the portion of the evaluation framework that deals with operational constraints.

This is a non-issue with Upper CASE tool products since, by their very nature, they are reports not associated with any particular environment.

Appendix E: Recommended Readings

1 General Selection Process

The papers in this section describe the process others have used to select and evaluate CASE tools. They emphasize the selection process and not selection criteria.

- 1-1 IEEE, p1209 Standard, "Recommended Practice for the Evaluation and Selection of CASE Tools."

This standard provides a recommended practice to evaluate and select CASE tools. This standard was primarily developed to provide guidance to evaluate and select tools used to support software engineering activities as opposed to general purpose tools, e.g., word processors, spread sheets, that may incidentally be used in support of software engineering activities.

2 General Management

These papers and reports contain information that is useful to managers needing an overview of the benefits and issues associated with Upper CASE software.

- 2-1 Bouldin, B., "Agents of Change: Managing the Introduction of Automated Tools," Prentice Hall, 1989.

This book contains a lot of good advice that is based upon the implementation of the CASE tool Excelsior at Bell Labs.

- 2-2 Brooks, F., "The Mythical Man-Month," Addison Wesley Publishing Co., 1978.

This best seller should be read by every project manager. At IBM, Brooks was the manager of the OS 360 project.

- 2-3 Gilb, T., "Principles of Software Engineering Management," Addison Wesley Publishing Company, 1988.

This book contains interesting ideas on quantifying qualitative goals. It advocates an extreme strategy for incremental delivery that makes a lot of sense.

- 2-4 Humphrey, W.S., "CASE Planning and the Software Process," CMU/SEI-89-TR-26, Software Engineering Institute, 1989.
This paper addresses the potential benefits and costs of CASE. The benefits and costs are broken down by an organization's level in the SEI Software Process Maturity Model. Brief management overviews and remedies of potential problems in the acquisition, installation, and use of CASE are given.
- 2-5 Humphrey, W.S., *"Managing the Software Process,"* Addison-Wesley, 1989.
Textbook that deals with understanding and managing the software process of an organization. This text summarizes the process maturity work at the SEI and provides practical guidance for assessing and improving the software development and maintenance process.
- 2-6 Yourdon, E., "Managing the System Life Cycle," Prentice Hall, 1988 (2nd edition).
A short, easy to read, minor rewrite of a much older book.

3 Evaluation/Selection Criteria

The papers in this section contain listings of evaluation and selection criteria that can be used.

- 3-1 Bowen, T.P., et al., "Specification of Software Quality Attributes: Software Quality Evaluation Guidebook," RADC-TR-85-37, Vol. III, Rome Air Development Center, February 1985.
This report contains definitions of software quality and how to measure it. The measurements are performed during software creation (different measurements at different parts of the lifecycle) with the goal of engineering software quality into the product. The Evaluation and Validation (E&V) manuals have an updated list of quality factors, criteria, and metrics. This is the original source. Its discussion of the attribute models is much more complete than the E&V discussion.

4 Methodologies

These papers and books describe widely used and popular Upper CASE methodologies.

- 4-1 Booch, G., *"Object Oriented Design With Applications,"* Prentice Hall, 1991.
This excellent book discusses issues that relate to every major object-oriented language. A new notation is introduced for OOD.
- 4-2 Buhr, R., *"Practical Visual Techniques in System Design,"* Englewood Cliffs, NJ, Prentice-Hall, 1990.
This book describes a method to design behavior-intensive systems (embedded, real-time, multitasking, multiprocessing, distributed) based on machine charts. Machine charts are a notational technique that supports the modeling of system behavior.
- 4-3 Chen, P., *"Entity-Relationship Approach to Systems Analysis and Design,"* North Holland Publishing Company, 1980.
This book covers entity relationship diagrams as well as entity relationship modeling.
- 4-4 Coad, P. and E. Yourdon, *"Object-Oriented Analysis,"* Englewood, NJ, Yourdon Press Computing Series, Prentice-Hall, 1990.
This book introduces object-oriented analysis, an analysis technique-based objects and attributes, classes and members, and wholes and parts. This is not a standardized method; rather, the book provides a starting point for using OOA within your particular organization, tailoring it to meet your specific needs.
- 4-5 Constantine, L. and E., Yourdon, *"Structured Design,"* Prentice Hall, 1975.
This book gives the most thorough treatment of the subject.
- 4-6 DeMarco, T., *"Structured Analysis and System" Specification,* Englewood Cliffs, N. J., Prentice-Hall, 1978.
This book covers structured analysis or the specification of systems using a methodology that is an extension of the Structured Design methodology that was proposed by Edward Yourdon and Larry Constantine.
- 4-7 Fleming, C. and B. von Halle, *"Handbook of Relational Database Design,"* Addison Wesley, 1989.
Procedures are given in a step-by-step fashion for producing a logical data model (ERD) and also for translating that model into a set of tuned relational database structures. The book is very comprehensive.

- 4-8 Hatley, D. and I. Pirbhai, "*Strategies for Real-Time System Specification*," New York City, N.Y., Dorset House Publishing Co., 1988.
This book covers a methodology to model the requirements and architecture of real-time systems. It integrates a finite-state machine structure into the classical structured analysis methods.
- 4-9 Hawryszkiewicz, I., "*Database Analysis and Design*," MacMillan Publishing Co., 1984.
Relational theory and entity relationship diagrams are treated in this good textbook. DBMS and implementation issues are also discussed.
- 4-10 Jackson, M., "*Principles of Program Design*," Academic Press, 1975.
This book presents an approach to software design that is data structure oriented.
- 4-11 Martin, J., "*Information Engineering, Book 3 - Design and Construction*," Prentice Hall, 1989.
This book deals with James Martin's Information Engineering Methodology.
- 4-12 Martin, J., "*Strategic Information Planning Methodologies*," Prentice Hall, 1989 (2nd edition).
The first edition (1982) has undergone a minor revision. Business Systems Planning is treated via an excellent discussion.
- 4-13 Mellor, S. and S. Shlaer, "*Object Lifecycles: Modeling the World in States*," Prentice Hall, 1992.
Introduction to Shlaer/Mellor object oriented analysis.
- 4-14 Myers, G., "*Composite/Structured Design*," Van Nostrand Reinhold Co., 1978.
This is an excellent book on structured design.
- 4-15 Orr, K., "*Structured Systems Development*," Prentice Hall, 1977.
This book gives a better description of the Warnier-Orr method.
- 4-16 Page-Jones, M., "*The Practical Guide to Structured Systems Design*," Prentice Hall, 1988 (2nd edition).
An excellent introduction to structured design. The second edition ties essential analysis to structured design.

- 4-17 Rumbaugh, J., and Michael Blaha, William Premerlani, Frederick Eddy, William Lorensen, "*Object-Oriented Modeling and Design*," Prentice Hall, c1991.
This book describes the widely use OMT methodology.
- 4-18 Ward P., and S. Mellor, "*Structured Development for Real-Time Systems*," Volume 1-3, Englewood Cliffs, N.J., Prentice-Hall, 1985.
These books describe a methodology for specifying requirements for real-time systems. This method is an extension of Structured Analysis, which was developed by Tom DeMarco.
- 4-19 Yourdon, E., and L. Constantine, "*Structured Design: Fundamentals of a Discipline of Computer Program and Systems Design*," Prentice-Hall, Englewood Cliffs, N.J., 1975.
This book covers a methodology on structured design which was a very popular method for designing software systems during the 1970s.

5 CASE Tool Economics

The papers in this section deal with the economics of using CASE tools. In particular, they address how software costs can be estimated and the economic benefits of using CASE tools.

- 5-1 Boehm, B., "*Software Engineering Economics*," Prentice-Hall, 1981.
This landmark textbook provides a very thorough treatment of the factors that impact the cost of software development. Many examples are included as well as detailed procedures for deriving cost estimates using the COConstructive COSt MOdel (COCOMO).
- 5-2 Card, D., F. McGarry, and G. Page, "Evaluating Software Engineering Technologies," *IEEE Transactions on Software Engineering*, Vol. SE-13, No. 7, July 1987.
This paper reports on the results of a study undertaken at the NASA Goddard Software Engineering Laboratory to empirically measure software development practices, tools, and techniques to evaluate the effects of these technologies on productivity and reliability. The study concluded that there was an approximate 30% increase in reliability but no direct effect on productivity was found.

Appendix F: Glossary of Terms

The following list of definitions was selected from the Glossary of Software Engineering Terminology that was an update to ANSI/IEEE Std 729-1983. The glossary was prepared by the Computer Dictionary Working Group chaired by Jane Radatz. This glossary subset relates to functionality and attributes dealing with Upper Case tools.

Abstract Data Type. A data type for which only the properties of the data and the operations to be performed on the data are specified, without concern for how the data will be represented or how the operations will be implemented.

Abstraction. (1) A view of an object that focuses on the information relevant to a particular purpose and ignores the remainder of the information. Also see: **Data Abstraction.** (2) The process of formulating a view as in (1).

Address. (1) A number, character, or group of characters that identifies a given device or storage location. (2) To refer to a device or storage location by an identifying number, character, or group of characters.

Algorithm. (1) A finite set of well-defined rules for the solution of a problem in a finite number of steps; for example, a complete specification of a sequence of arithmetic operations for evaluating $\sin x$ to a given precision. (2) Any sequence of operations for performing a specific task.

Application Generator. A code generator that produces programs to solve one or more problems in a particular application area; for example, a payroll generator.

Application Software. Software designed to fulfill specific needs of a user; for example, software for navigation, payroll, or process control. Contrast with: **Support Software; System Software.**

Architectural Design. (1) The process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computer system. Also see: **Functional Design.** (2) The result of the process in (1).

Atomic Type. A data type each of which its members consists of a single, nondecomposable data item. Contrast with: **Composite Type.**

Attribute. A characteristic of an item; for example, the item's color, size, or type. Also see: **Quality Attribute.**

Automated Verification System. (1) A software tool that accepts as input a computer program and a representation of its specification and produces, possibly with human help, a proof or disproof of the correctness of the program. (2) Any software tool that automates part or all of the verification process.

Background. In job scheduling, the computing environment in which low-priority processes or those that do not require user interaction are executed. Contrast with: **Foreground.** Also see background processing.

Background Processing. The execution of a low-priority process while higher-priority processes are not using computer resources, or the execution of processes that do not require user interaction. Contrast with: **Foreground Processing.**

Backup. (1) A system, component, file, procedure, or person available to replace or help restore a primary item in the event of a failure or externally-caused disaster. (2) To create or designate a system, component, file, procedure, or person as in (1).

Benchmark. (1) A standard against which measurements or comparisons can be made. (2) A procedure, problem, or test that can be used to compare systems or components to each other or to a standard as in (1). (3) A recovery file.

Black Box. (1) A system or component of which its inputs, outputs, and general function are known but its contents or implementation are unknown or irrelevant. Contrast with:
Glass Box. (2) Pertaining to an approach that treats a system or component as in (1). Also see: **Encapsulation.**

Block Diagram. A diagram of a system, computer, or device in which the principal parts are represented by suitably annotated geometrical figures to show both the functions of the parts and their functional relationships. Also see: **Box Diagram; Bubblechart; Flowchart; Graph; Input-Process-Output Chart; Structure Chart.**

Bottom-Up. Pertaining to an activity that starts with the lowest level components of a hierarchy and proceeds through progressively higher levels; for example, bottom-up design; bottom-up testing. Contrast with: **Top-Down.** Also see: **Critical Piece First.**

Box Diagram. A control flow diagram that consists of a rectangle that is subdivided to show sequential steps, if-then-else conditions, repetition, and case conditions.

Bubble Chart. A data flow, data structure, or other diagram in which entities are depicted with circles (bubbles) and relationships are represented by links drawn between the circles.

Call Graph. A diagram that identifies the modules in a system or computer program and shows which modules call one another. Note: The result is not necessarily the same as that shown in a structure chart.

CASE. Acronym for Computer-Aided Software Engineering.

Code Generator. (1) A routine, often part of a compiler, that transforms a computer program from some intermediate level of representation (often the output of a root compiler or parser) into a form that is closer to the language of the machine on which the program will execute. (2) A software tool that accepts as input the requirements or design for a computer program and produces source code that implements the requirements or design.

Composite Type. A data type each of which its members is composed of multiple data items. For example, a data type called PAIRS of which its members are ordered pairs (x,y). Contrast with: **Atomic Type.**

Computer-Aided Software Engineering (CASE). The use of computers to aid in the software engineering process. May include the application of software tools to software design, requirements tracing, code production, testing, document generation, and other software engineering activities.

Computer System. A system containing one or more computers and associated software.

Concept Phase. (1) (ANSI/IEEE Std 1002-1987) The period of time in the software development cycle during which the user needs are described and evaluated through documentation (for example, statement of needs, advance planning report, project initiation

memo, feasibility studies, system definition, documentation, regulations, procedures, or policies relevant to the project). (2) (ANSI/IEEE Std 1012-1987) The initial phase of a software development project in which the user needs are described and evaluated through documentation (for example, statement of needs, advance planning report, project initiation memo, feasibility studies, system definition, documentation, regulations, procedures, or policies relevant to the project).

Control Flow. The sequence in which operations are performed during the execution of a computer program. Contrast with: **Data Flow.**

Control Flow Diagram. A diagram that depicts the set of all possible sequences in which operations may be performed during the execution of a system or program. Types include box diagram, flowchart, input-process-output chart, state diagram. Contrast with: **Data Flow Diagram.**

Critical Piece First. A system development approach in which the most critical aspects of a system are implemented first. The critical piece may be defined in terms of services provided, degree of risk, difficulty, or other criteria.

Data. (1) A representation of facts, concepts, or instructions in a manner suitable for communication, interpretation, or processing by humans or by automatic means. (2) Sometimes used as a synonym for documentation.

Data Abstraction. (1) The process of extracting the essential characteristics of data by defining data types and their associated functional characteristics and disregarding representation details. (2) The result of the process in (1).

Data Flow. The sequence in which data transfer, use, and transformation are performed during the execution of a computer program. Contrast with: **Control Flow.**

Data Flow Diagram (DFD). A diagram that depicts data sources, data sinks, data storage, and processes performed on data as nodes, and logical flow of data as links between the nodes.

Data Structure. A physical or logical relationship among data elements, designed to support specific data manipulation functions. Note: IEEE Std 610.5 defines specific data structures.

Data Structure-Centered Design. A software design technique in which the architecture of a system is derived from analysis of the structure of the data sets with which the system must deal.

Data Structure Diagram. A diagram that depicts a set of data elements, their attributes, and the logical relationship among them.

Data Type. A class of data, characterized by the members of the class and the operations that can be applied to them. For example, character type, enumeration type, integer type, logical type, and real type.

Database. A collection of interrelated data stored together in one or more computerized files. Note: IEEE Std 610.5 defines terminology pertaining to databases.

Demodularization. In software design, the process of combining related software modules, usually to optimize system performance.

Design. (1) The process of defining the architecture, components, interfaces, and other characteristics of a system or component. (2) The result of the process in (1).

Design Description. A document that describes the design of a system or component. Typical contents include system or component architecture, control logic, data structures, input/output formats, interface descriptions, and algorithms.

Design Element. (ANSI/IEEE Std 990-1987) A basic component or building block in a design.

Design Entity. (ANSI/IEEE Std 1016-1987) An element (component) of a design that is structurally and functionally distinct from other elements and that is separately named and referenced.

Design Level. (ANSI/IEEE Std 829-1983) The design decomposition of the software item (for example, system, subsystem, program, or module).

Design Phase. The period of time in the software lifecycle during which the designs for architecture, software components, interfaces, and data are created, documented, and verified to satisfy requirements.

Design Requirement. A requirement that specifies or constrains the design of a system or system component.

Detailed Design. (1) The process of refining and expanding the preliminary design of a system or component to the extent that the design is sufficiently complete to be implemented. (2) The result of the process in (1).

Directed Graph. A graph in which direction is implied in the internode connections.

Dynamic Analysis. The process of evaluating a system or component based on its behavior during execution.

Efferent. Pertains to a flow of data or control from a superordinate module to a subordinate module in a software system.

Embedded Computer System. A computer system that is part of a larger system and performs some of the requirements of that system; for example, a computer system used in an aircraft or rapid transit system.

Embedded Software. Software that is part of a larger system and performs some of the requirements of that system; for example, software used in an aircraft or rapid transit system.

Encapsulation. A software development technique that consists of isolating a system function or a set of data and operations on those data within a module and providing precise specifications for the module.

Entity-Relationship (E-R) Diagram. A diagram that depicts a set of real-world entities and the logical relationships among them.

Extendability. The ease with which a system or component can be modified to increase its storage or functional capacity.

Feasibility. The degree to which the requirements, design, or plans for a system or component can be implemented under existing constraints.

Finite State Machine. A computational model that consists of a finite number of states and transitions between those states, possibly with accompanying actions.

Function. (1) A defined objective or characteristic action of a system or component. For example, a system may have inventory control as its primary function. (2) A software module that performs a specific action, is invoked by the appearance of its name in an expression, may receive input values, and returns a single value.

Hierarchical Decomposition. A type of modular decomposition in which a system is broken down into a hierarchy of components through a series of top-down refinements.

Implementation Requirement. A requirement that specifies or constrains the coding or construction of a system or system component.

Information Hiding. A software development technique in which each module's interfaces reveal as little as possible about the module's inner workings and other modules are prevented from using information about the module that is not in the module's interface specification.

Input-Process-Output (IPO) Chart. A diagram of a software system or module that consists of a rectangle on the left listing inputs, a rectangle in the center listing processing steps, a rectangle on the right listing outputs, and arrows connecting inputs to processing steps and processing steps to outputs.

Interoperability. The ability of two or more systems or components to exchange information and to use the information that has been exchanged.

Microarchitecture. The microword definition, data flow, timing constraints, and precedence constraints that characterize a given microprogrammed computer.

Modular Decomposition. The process of breaking a system into components to facilitate design and development; an element of modular programming.

Modularity. The degree to which a system or computer program is composed of discrete components such that a change to one component has minimal impact on other components.

Node. (1) In a diagram, a point, circle, or other geometric figure used to represent a state, event, or other item of interest. (2) Note: The meaning of this term in the context of computer networks is covered in IEEE Std 610.5.

Object-Oriented Design. A software development technique in which a system or component is expressed in terms of objects and connections between those objects.

Partitioning. (ANSI/IEEE Std 830-1984) Decomposition; the separation of the whole into its parts.

Performance Requirement. A requirement that imposes conditions on a functional requirement; for example, a requirement that specifies the speed, accuracy, or memory usage with which a given function must be performed.

Petri Net. An abstract, formal model of information flow, showing static and dynamic properties of a system. A Petri net is usually represented as a graph that has two types of nodes

(called places and transitions) connected by arcs, and markings (called tokens) indicating dynamic properties.

Portability. The ease with which a system or component can be transferred from one hardware or software environment to another.

Prototyping. A hardware and software development technique in which a preliminary version of part or all of the hardware or software is developed to permit user feedback, determine feasibility, or investigate timing or other issues in support of the development process.

Rapid Prototyping. A type of prototyping in which emphasis is placed on developing prototypes early in the development process to permit early feedback and analysis in support of the development process.

Real-Time. Pertains to a system or mode of operation in which computation is performed during the actual time that an external process occurs, so the computation results can be used to control, monitor, or respond in a timely manner to the external process.

Requirements Analysis. (1) The process of studying user needs to arrive at a definition of system, hardware, or software requirements. (2) The process of studying and refining system, hardware, or software requirements.

Reusability. The degree to which a software module or other work product can be used in more than one computer program or software system.

Shell. A computer program or routine that provides an interface between the user and a computer system or program.

Simulation. (1) A model that behaves or operates like a given system when provided a set of controlled inputs. (2) The process of developing or using a model as in (1).

Sizing. The process of estimating the amount of computer storage or the number of source lines required for a software system or component.

Structure Chart. A diagram that identifies modules, activities, or other entities in a system or computer program and shows how larger or more general entities break down into smaller, more specific entities.

Structured Design. (1) Any disciplined approach to software design that adheres to specified rules based on principles such as modularity, top-down design, and stepwise refinement of data, system structures, and processing steps. (2) The result of applying the approach in (1).

Taxonomy. (ANSI/IEEE Std 1002-1987) A scheme that partitions a body of knowledge and defines the relationships among the pieces. It is used to classify and understand the body of knowledge.

Timing. The process of estimating or measuring the amount of execution time required for a software system or component. Contrast with: **Sizing.**

Top-Down. Pertains to an activity that starts with the highest level component of a hierarchy and proceeds through progressively lower levels; for example, top-down design; top-down testing. Contrast with: **Bottom Up.**

Unidirected Graph. A graph in which no direction is implied in the internode connections. Contrast with: **Directed Graph.**

Validation. The process of evaluating a system or component during or at the end of the development process to determine whether it satisfies specified requirements. Contrast with: **Verification.**

Verification. (1) The process of evaluating a system or component to determine whether the products of a given development phase satisfy the conditions imposed at the start of that phase. Contrast with: **Validation.**

Verification and Validation (V&V). The process of determining whether the requirements for a system or component are complete and correct, the products of each development phase fulfill the requirements or conditions imposed by the previous phase, and the final system or component complies with specified requirements.

Waterfall Model. A model of the software development process in which the constituent activities, typically a concept phase, requirements phase, design phase, implementation phase, test phase, and installation and checkout phase, are performed in that order, possibly with overlap but with little or no iteration.

Appendix G: Software Technology Support Center

G.1 The Software Technology Support Center

The mission of the Software Technology Support Center (STSC) is to assist Air Force organizations to understand, evaluate, pilot, and adopt technologies that will improve the productivity and maturity of their software processes.

A planned approach is necessary for successful transition. In general, transitioning effective practices, processes, and technologies consist of a series of activities or events that occur between the time a person encounters a new idea and the daily use of that idea. Conner and Patterson's Adoption Curve¹, shown in Figure G-1, illustrates these activities.

After encountering a new process or technology, potential customers of that technology increase their awareness of its usage, maturity, and application. If the process or technology is promising, then customers try to better understand its strengths, weaknesses, costs, and applications. These first activities in the adoption curve take a significant amount of time.

Next, the customer evaluates and compares the processes and technologies that show the most promise. To reduce the risk, customers usually try new processes or technologies on a limited scale through beta tests, case studies, or pilot projects. A customer then adopts processes or technologies that prove effective. Finally, refined processes and technologies become essential parts of an organization's daily process (institutionalization).

¹ Conner, Daryl R. and Robert W. Patterson, "Building Commitment to Organizational Change," *Training and Development Journal*, Vol 36, Number 4, pp. 18-30 (April 1982).

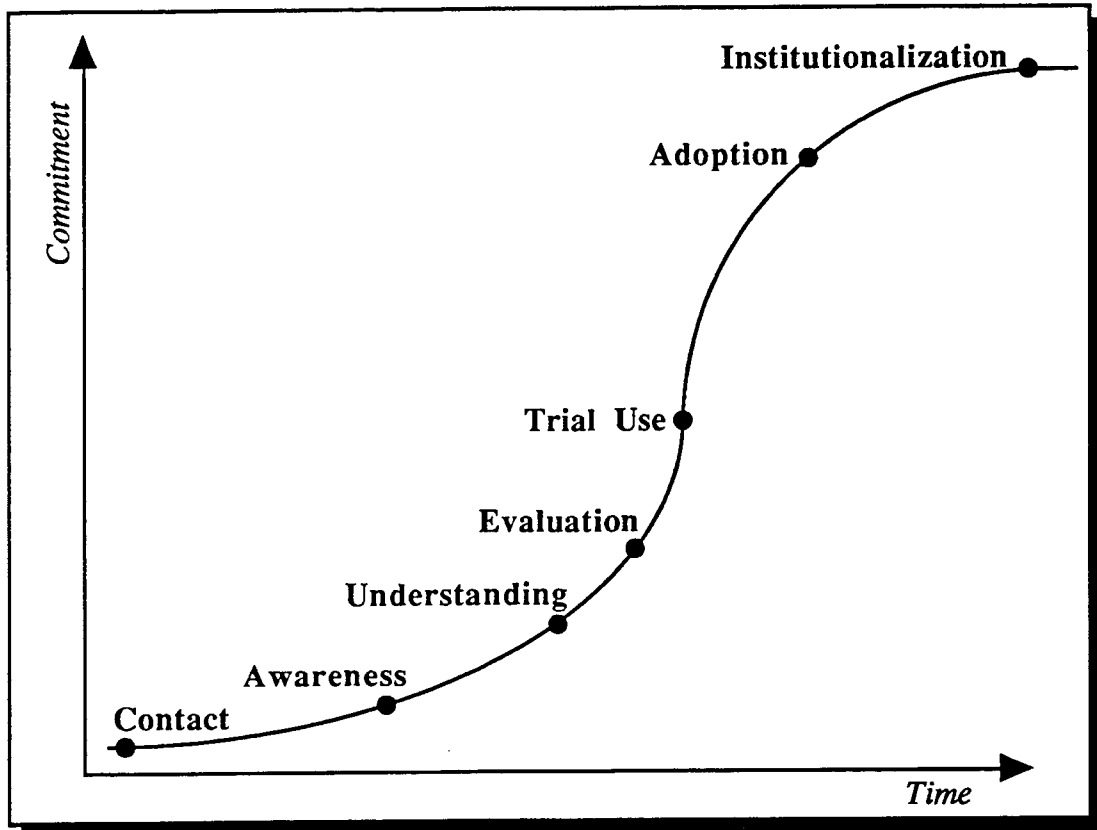


Figure G-1. Adoption Curve

Word processors are essential in most organization's daily operations. Yet, 30 years ago they did not exist. The institutionalization of word processors in many organizations followed a series of events similar to those identified in the adoption curve.

The STSC is researching and collecting information about technologies that will reduce the time and resources it takes to become aware, understand, evaluate, test, try, and adopt effective practices, processes, and technologies. The STSC has developed the following objectives to accomplish its mission:

- **Technology Evaluation**
Identify, validate, classify, and evaluate effective processes and technologies.
- **Information Exchange**
Facilitate the exchange of better software business practices, processes, and technologies within the DoD.
- **Insertion Projects**
Analyze and improve processes, adopt new methodologies as needed, evaluate and select effective tools, receive appropriate levels of training,

and perform pilot projects to try out and confirm the technology insertion efforts.

- STSC Associates
Develop STSC associates who can infuse effective process and technology improvements through the use of STSC products, services, and processes.

G.2 STSC Technology Transition Approach

This section describes the STSC's approach to meeting the objectives identified in the previous section.

G.2.1 Technology Evaluation

The first technology transition objective is to identify, validate, and classify processes, methods, and technologies that can potentially improve the quality or productivity of software development and maintenance. Many organizations are so focused on deadlines and customer needs that they lack the resources and time to thoroughly investigate options for improvement, leaving them vulnerable to marketing hype. The STSC has developed the infrastructure to provide information on all types of applicable technologies. Product critiques, which are essentially brief evaluations from experienced technology users, are collected. Quantitative evaluations, which are detailed, comparable, and objective, are performed on the most promising tools, methods, or processes.

G.2.2 Information Exchange

This technology transition objective involves exposing potential customers to available technologies and, conversely, customer requirements to technology developers. Referring to the adoption curve, this objective focuses on contact, awareness, and understanding. STSC products that accomplish this objective include *CrossTalk* (a monthly technology report), the annual Software Technology Conference, specific technology reports, and electronic customer services.

G.2.2.1 *Crosstalk*

Over 10,500 software professionals receive *Crosstalk* monthly. This publication provides a forum for the exchange of ideas. Articles cover leading edge, state-of-the-art, and state-of-the-practice processes and technologies in software engineering.

G.2.2.2 *Software Technology Conference*

The annual Software Technology Conference is held each April in Salt Lake City, Utah. This conference brings together over 2,000 software professionals from government, industry, and academia to share technology solutions and exchange ideas and information.

G.2.2.3 *Technology Reports*

STSC technology reports provide detailed information on specific software engineering technologies; and this report is an example. The current list of reports include:

- Test Preparation, Execution, and Evaluation
- Documentation
- Project Management
- Software Cost Estimation
- Requirements Analysis and Design
- Reengineering
- Source Code Static Analysis
- Software Engineering Environments

These reports provide awareness and understanding of each topic in preparation for evaluation and selection of corresponding technologies. Over 30,000 of these reports have been distributed.

G.2.2.4 Electronic Customer Services

Along with the services mentioned above, the STSC also provides customers with electronic access to information via Electronic Customer Services (ECS). ECS includes a bulletin board system that is available to obtain additional information, leave messages, add information, and confer electronically. In addition, a computerized database of practice, process, and technology information is coming online. ECS can be accessed via the Internet at address 137.241.33.1 or stscbbs.a1.mil or by calling 801-774-6509 with modem at 2400 or 9600 baud, 8 bit word, 1 stop bit, and no parity.

G.2.3 Technology Insertion Projects

STSC technology insertion projects are customer-oriented projects that evaluate, select, and pilot the use of new processes, methods, and technologies for a specific customer. These projects can include process definition, process improvement, methodology insertion, tool insertion, and development of a technology road map. Referring to the adoption curve, Figure G-1, an insertion project helps cement understanding of a process or technology, tailors an evaluation of the process or technology for the customer, and pilots the use of that process or technology with appropriate levels of training. Customers move closer to adoption of the process or technology through hands-on experience. It is important to try out technology improvements in a pilot project to confirm that the technology is appropriate for the organization and that the organization is ready and able to adopt the new technology.

G.2.4 STSC Associates

Fowler and Przybylinski² propose that transitioning new technologies from a developer to a consumer requires an advocate to push the technology and a receptor to pull the technology into an organization. This concept is illustrated in Figure G-2.

Effective change comes from within the organization. The STSC Associates objective is to develop technology receptors within individual Air Force SDSAs. These receptors, STSC Associates, are trained in the use of the STSC's information, products, and services to enhance their organization's ability to incorporate advanced practices, processes, and technologies.

² Fowler, Pricilla and Stan Przybylinski, **Transferring Software Engineering Tool Technology**, IEEE Computer Society Press, Washington D.C., (1988).

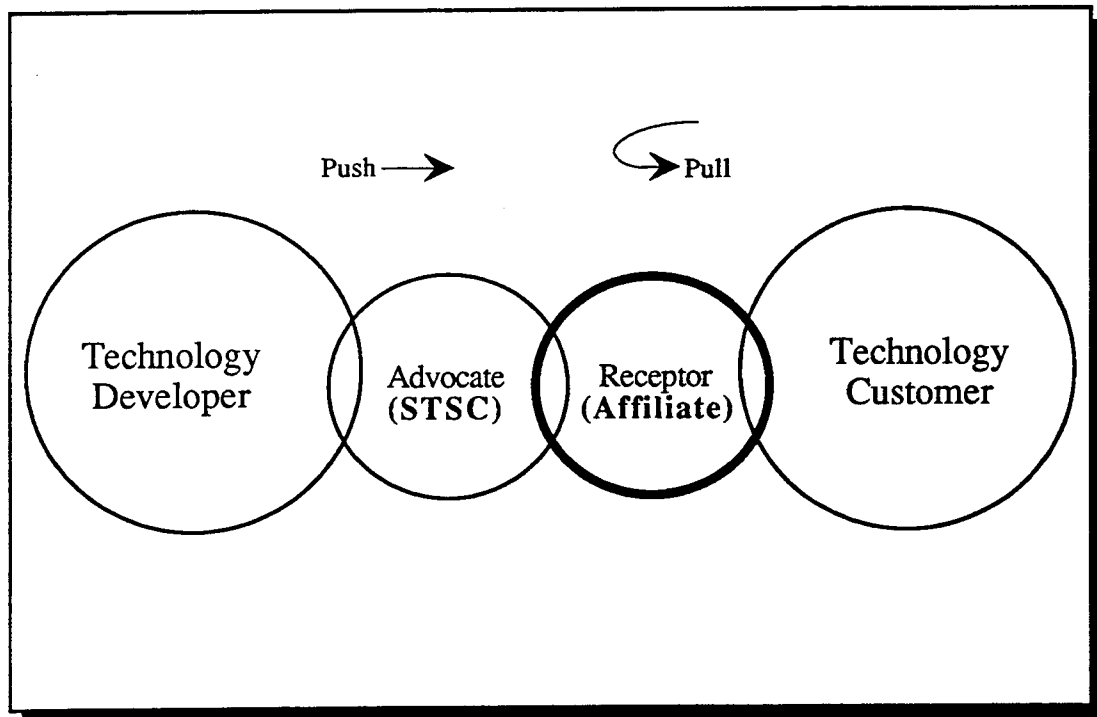


Figure G-2. Transitioning Technology

Referring to the adoption curve in Figure G-1, STSC associates complete the trek to institutionalization. Associates coming from within the organization should be politically astute and aware of internal organizational requirements. They have the highest probability of influencing the adoption and daily use of effective business practices, processes, and technologies.

G.3 Embedded Computer Resources Support Improvement Program (ESIP)

The STSC operates out of the Ogden Air Logistics Center at Hill Air Force Base, Utah, under the direction and guidance of the ESIP Steering Group. An Air Force program, the ESIP has the goals to reduce the software backlog and increase software quality and productivity. Its mission is to provide an infrastructure to assist in the transitioning of technology to support all categories of embedded computer systems throughout the acquisition cycle and improve the readiness of Air Force weapon systems. ESIP is directed by an Air Force program management directive (PMD3118) and is led by a major command level steering group. The steering group had representation from the following organizations: AFMC, AFSPACECOM, USSTRATCOM, ACC, AFOTEC. The voting members of ESIP are:

Col Charles Fuller, DSN 458-2435, commercial 801-777-2435, fax DSN 458-9034

Capt Mike Helsabeck, DSN 576-8189, commercial 618-256-8189, fax DSN 576-8939

Capt Jonathan Liles, DSN 787-2151, commercial 513-257-2151, fax DSN 787-0841

Maj Barbara Nelson, DSN 692-5054, commercial 719-554-5054, fax DSN 692-3350

Capt Sean O'Connell, DSN 271-3278, commercial 402-294-3278, fax DSN 271-1020

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